MATADERO/BARRON CREEKS REMEDIATION PROJECT, SANTA CLARA COUNTY, CALIFORNIA, IDENTIFICATION OF WATERS OF THE U.S.

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10 April 2002

Project No. 1518-01

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EXECUTIVE SUMMARY

H. T. Harvey & Associates' biologists surveyed all portions of the project site from January through May 2000, and during August 2001 for areas that may meet the regulatory jurisdiction of Waters of the United States (jurisdictional waters). The purpose of this work was to identify the extent and distribution of current jurisdictional waters, both Section 404 and Section 10, located within the project boundaries under conditions existing at the time of the survey. In addition, Historic Section 10 waters were also identified to the extent feasible.

The project site is comprised of two geographic locations; the downstream portion of Matadero Creek located directly adjacent to the east side of U.S. Highway 101, and the upstream portion of Matadero Creek located at the Louis Road bridge crossing approximately one-half mile west of U.S. Highway 101.

Current Section 404 jurisdictional waters totaled approximately 2.076 acres. These areas include approximately 0.604 acres of tributary waters, approximately 1.404 acres of potential wetlands, and approximately 0.068 acres of other waters. The site also includes approximately 0.533 acres of Historic and Current Section 10 waters. PLEASE NOTE: Section 10 waters overlap with Section 404 waters.

Potential jurisdictional waters for each of the two locations on site are summarized below. The remainder of the project site met none of the regulatory definition of jurisdictional waters.

Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site East of U.S. Highway 101, Santa Clara County, California

HABITATS	ACRES
Current Section 404-Jurisdictional Waters:	
Tributary Waters	0.533
Wetlands	1.404
Other Waters	0.068
Total Section 404-Jurisdictional Waters	**2.005**
Current Section 10-Jurisdictional Waters	**(0.533)** overlaps with tributary waters
Historic Section 10-Jurisdictional Waters	**(0.533)** overlaps with tributary waters
TOTAL	**2.005**

Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site West of U.S. Highway 101, Santa Clara County, California

HABITATS	ACRES
Current Section 404-Jurisdictional Waters:	
Tributary Waters	0.071
Total Section 404-Jurisdictional Waters	**0.071**
Current Section 10-Jurisdictional Waters	None
Historic Section 10-Jurisdictional Waters	None
TOTAL	**0.071**

TABLE OF CONTENTS

EXECUTIVE SUMMARY i
TABLE OF CONTENTS ii
INTRODUCTION 1
  PROJECT AREA DESCRIPTION 1
  SURVEY PURPOSE 4
  SURVEY METHODS 4
    A) Identification of Section 404: Special Aquatic Sites; Including Jurisdictional Wetlands. .9
    B) Identification of Section 404: Tributary Waters 11
    C) Identification of Section 404: "Other Waters" 11
    D) Identification of Historical and Current Section 10 Waters 11
SURVEY RESULTS 13
  OBSERVATIONS / RATIONALE / APPROACH / ASSUMPTIONS 13
  AREAS MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS 14
    A) Identification Jurisdictional Wetlands (Special Aquatic Sites) 14
    B) Identification of Tributary Waters 15
    C) Identification of "Other Waters" 17
    D) Identification of Historical and Current Section 10 Waters 17
  AREAS NOT MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS 17
LITERATURE CITED 19
APPENDIX A. PLANTS OBSERVED ON THE MATADERO CREEK FLOOD CONTROL PROJECT AREA 20
APPENDIX B. SOILS OF THE MATADERO CREEK FLOOD CONTROL PROJECT AREA 23
APPENDIX C. WETLAND DETERMINATION DATA FORMS FOR THE MATADERO CREEK FLOOD CONTROL PROJECT AREA 47
APPENDIX D. PHOTOGRAPHS OF THE MATADERO CREEK FLOOD CONTROL PROJECT AREA 72

FIGURES:

Figure 1. Site/Vicinity Map 2
Figure 2. U.S.G.S. Map 3
Figure 3. Soils Map 5
Figure 4. NWI Map 6
Figure 5. Historic Waters 7
Figure 6. Jurisdictional Waters of the Project Site East of U.S. 101 ..... (oversized)

Figure 7. Jurisdictional Waters of the Project Site West of U.S. 101 16

TABLES:

Table 1. Wetland Indicator Status Categories for Vascular Plants 10
Table 2. Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site East of U.S. Highway 101, Santa Clara County, California 18
Table 3. Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site West of U.S. Highway 101, Santa Clara County, California 18

INTRODUCTION

PROJECT AREA DESCRIPTION

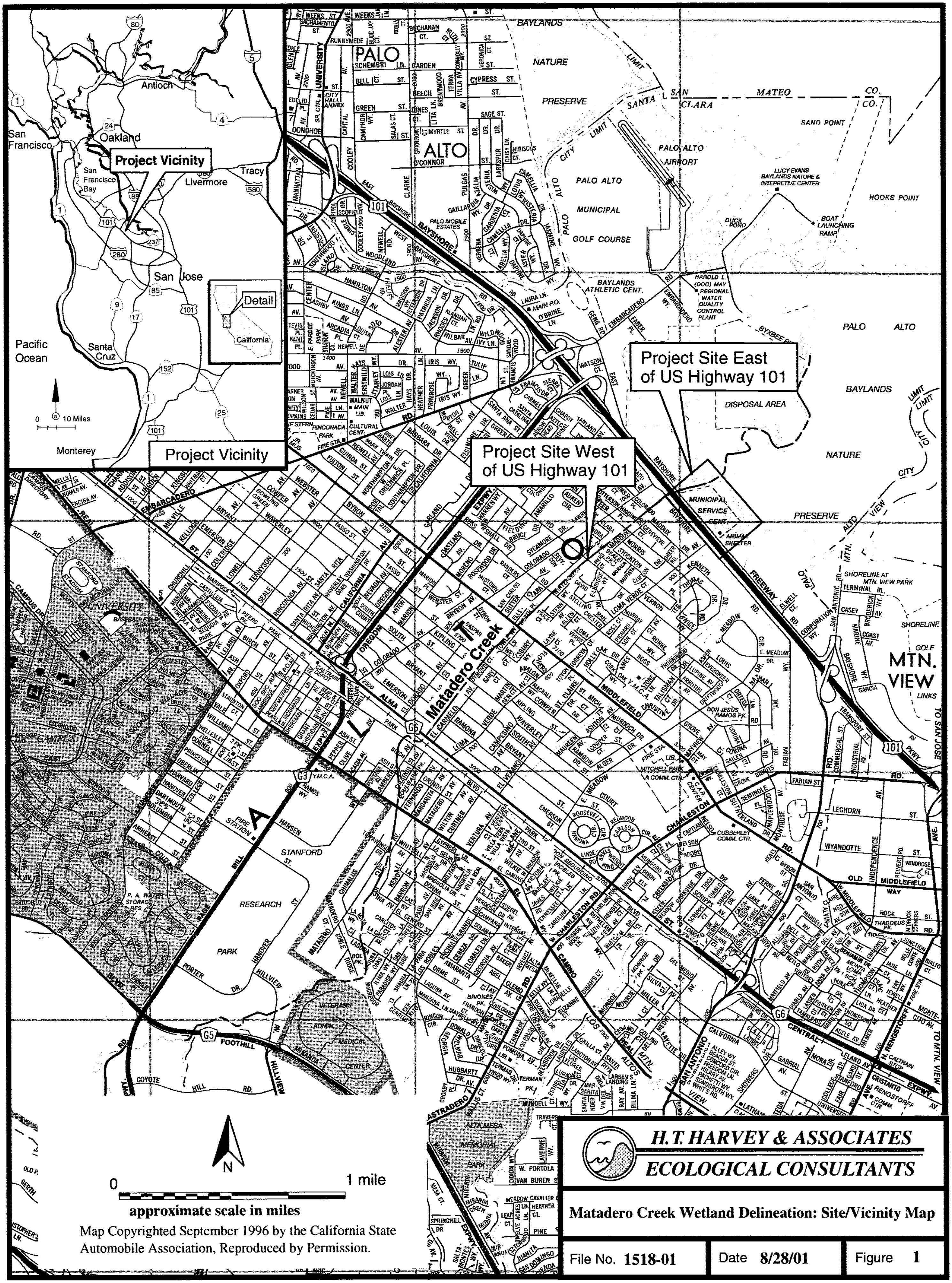
In order to provide improved flood protection for Matadero and Barron Creeks, the Santa Clara Valley Water District (SCVWD) proposes to implement further flood protection measures in two locations along Matadero Creek between El Camino Real and the Palo Alto Flood Basin. The project components within the reach of Matadero Creek upstream of Highway 101 includes the raising of existing floodwalls, the construction of a U-shaped channel in place of the trapezoidal shaped channel at the Louis Road Bridge crossing and the raising of Louis Road Bridge. The flood control improvements proposed for the downstream reach of Matadero Creek east of U.S. Highway 101 include the construction of a secondary bypass channel to carry high flow events into the Palo Alto Flood Basin. The bypass channel is designed to decrease backwater pressure by improving conveyance of storm flows to the Palo Alto Flood Basin.

Although the majority of the project's impacts to biological resources will occur from the downstream improvements, flood protection improvements are also planned for the upstream reach of Matadero Creek. This stretch of Matadero Creek is currently a concrete lined, trapezoidal-shaped channel with concrete floodwalls located at top of bank. Flood protection measures for the upstream reach of the creek include raising the Louis Road Bridge, widening a 120-foot section of the creek channel by creating a U-frame, concrete lined channel and raising some of the existing floodwalls.

The impacts to biotic resources are limited to the proposed downstream improvements east of U.S. Highway 101. These proposed improvements are located on the south side of Matadero Creek. This stretch of Matadero Creek is bordered by East Bayshore Road on the west and the MSC to the south.

The design includes the construction of a bypass channel at Matadero Creek immediately east of East Bayshore Road. Flood flows would be conveyed by the bypass channel. The bypass channel is proposed immediately adjacent to the City of Palo Alto's Municipal Service Center (MSC), in a location that would avoid excessive removal of riparian and wetland vegetation. The bypass channel will be concrete lined and accessible for interim maintenance including sediment and vegetation removal.

The project site is located on the Mountain View U.S.G.S. Quadrangle Map, in the northwest section of the quadrangle in Range 2 West, Township 6 South (Figure 2). The downstream portion of the site encompasses an area surrounding a portion of the lower reach of Matadero Creek. Water in the creek is conveyed into the Mayfield Slough that lies directly adjacent to the northeast corner of the project site. The Matadero Creek floodplain is essentially flat and without substantial topographic relief. Elevations within the study area vary from less than 0.0 feet National Geodetic Vertical Datum (NGVD) along Matadero Creek to around 6.0 feet NGVD along the near edge of the MSC. The Palo Alto area has a mean maximum temperature of 69.3



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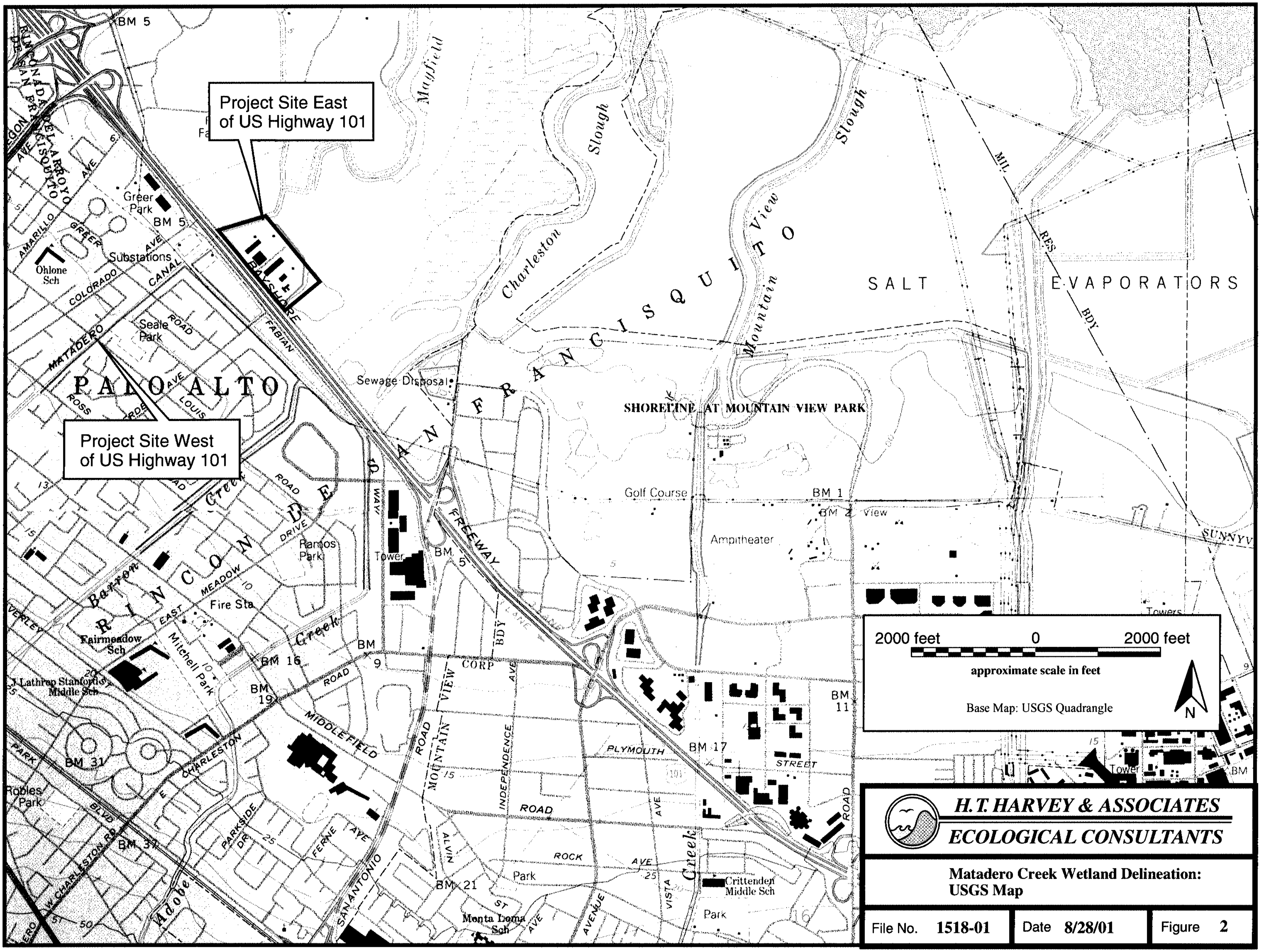
Matadero Creek Wetland Delineation: Site/Vicinity Map

File No. **1518-01**	Date **8/28/01**	Figure **1**



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Matadero Creek Wetland Delineation: USGS Map

File No. 1518-01	Date 8/28/01	Figure 2

degrees Fahrenheit (°F) and a mean minimum temperature of 46.6°F. Temperatures in the summer months may reach into the 90°F range. The mean annual precipitation in the project vicinity is approximately 15.4 inches (Western Regional Climate Center).

The project site is underlain by Alviso clay soils, tidal marsh, and Sunnyvale silty clay soils (Figure 3). Alviso clay is a very poorly drained, fine-textured soil with an underlayer of sedimentary alluvium, which formed on tidal flats along San Francisco Bay. This soil type is usually salty, calcareous, and somewhat alkaline and displays a stratified, silty, clay loam texture. Tidal marsh areas are within the Alviso clay soils profile and are periodically covered by ocean water. Sunnyvale silty clay is a poorly drained, fine-textured soil with an underlayer of gleyed sedimentary alluvium formed in low level positions of the alluvial plains. Alviso clay soil, tidal marsh areas, and Sunnyvale silty clay soil are listed as hydric soils of the United States. (Soil Conservation Service 1968)

The U.S. Fish and Wildlife Service (USFWS) has classified wetland resources on the site under the National Wetland Inventory (NWI) system (Figure 4). The area surrounding Matadero Creek east of U.S. Highway 101 has been classified as having seasonally-flooded, palustrine, scrub-shrub habitats, while the remainder of the project area is classified as irregularly-flooded, emergent, estuarine, intertidal habitat. The area within the concrete-lined portion of Matadero Creek west of U.S. Highway 101 has been classified as riverine, intermittent streambed, semipermanently flooded, artificial substrate, excavated.

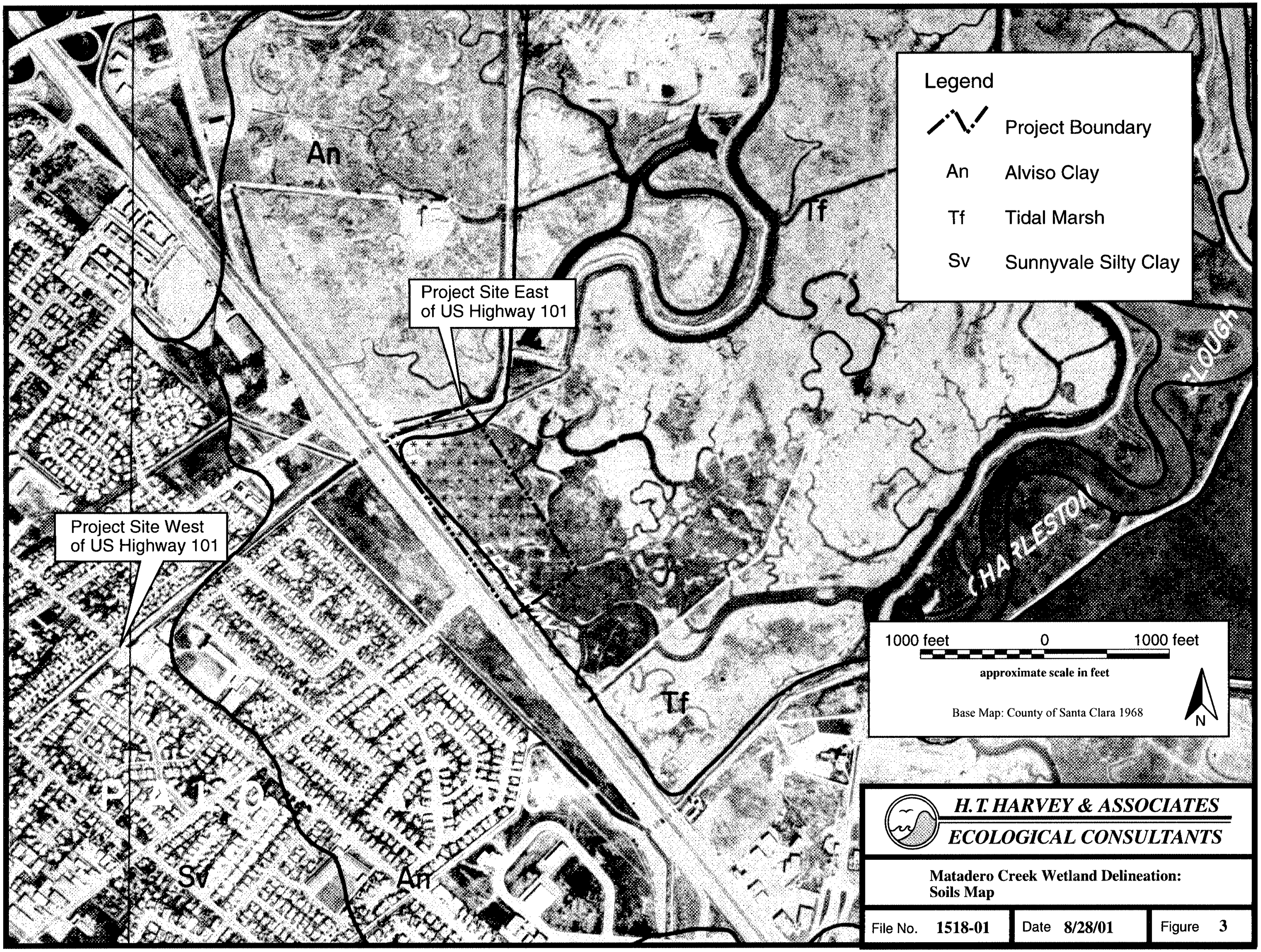
The entire downstream portion of the Matadero Creek channel east of U.S. Highway 101 was at one time part of the tidal salt marshes of southwest San Francisco Bay (Figure 5). This portion of the channel was historically mapped as the extreme west end of Mayfield Slough.

SURVEY PURPOSE

H. T. Harvey & Associates biologists' surveyed all portions of the project site for areas that may meet the regulatory definition of Waters of the United States (jurisdictional waters). Development in areas identified as such is subject to the permit requirements of the U. S Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (1972) and Section 10 of the Rivers and Harbors Act (1899). The primary purpose of this work was to identify the extent and location of jurisdictional waters occurring within the project boundaries under conditions existing at the time of the survey.

SURVEY METHODS

Field surveys for jurisdictional waters within the project site were conducted from April to May 2000 and during August of 2001. The extent and distribution of jurisdictional waters were identified using methodologies approved by the USACE. Personnel included plant ecologists Patrick Boursier, Ph.D., Mary Bacca, M.S., and Brian Cleary, M.S. Field studies were conducted at a level of effort sufficient for review by the USACE.



Legend
Project Boundary
An Alviso Clay
Tf Tidal Marsh
Sv Sunnyvale Silty Clay
An
Tf
Project Site East of US Highway 101
Project Site West of US Highway 101
CHARLESTON SLOUGH
Tf
Sv
An
1000 feet 0 1000 feet
approximate scale in feet
Base Map: County of Santa Clara 1968
N

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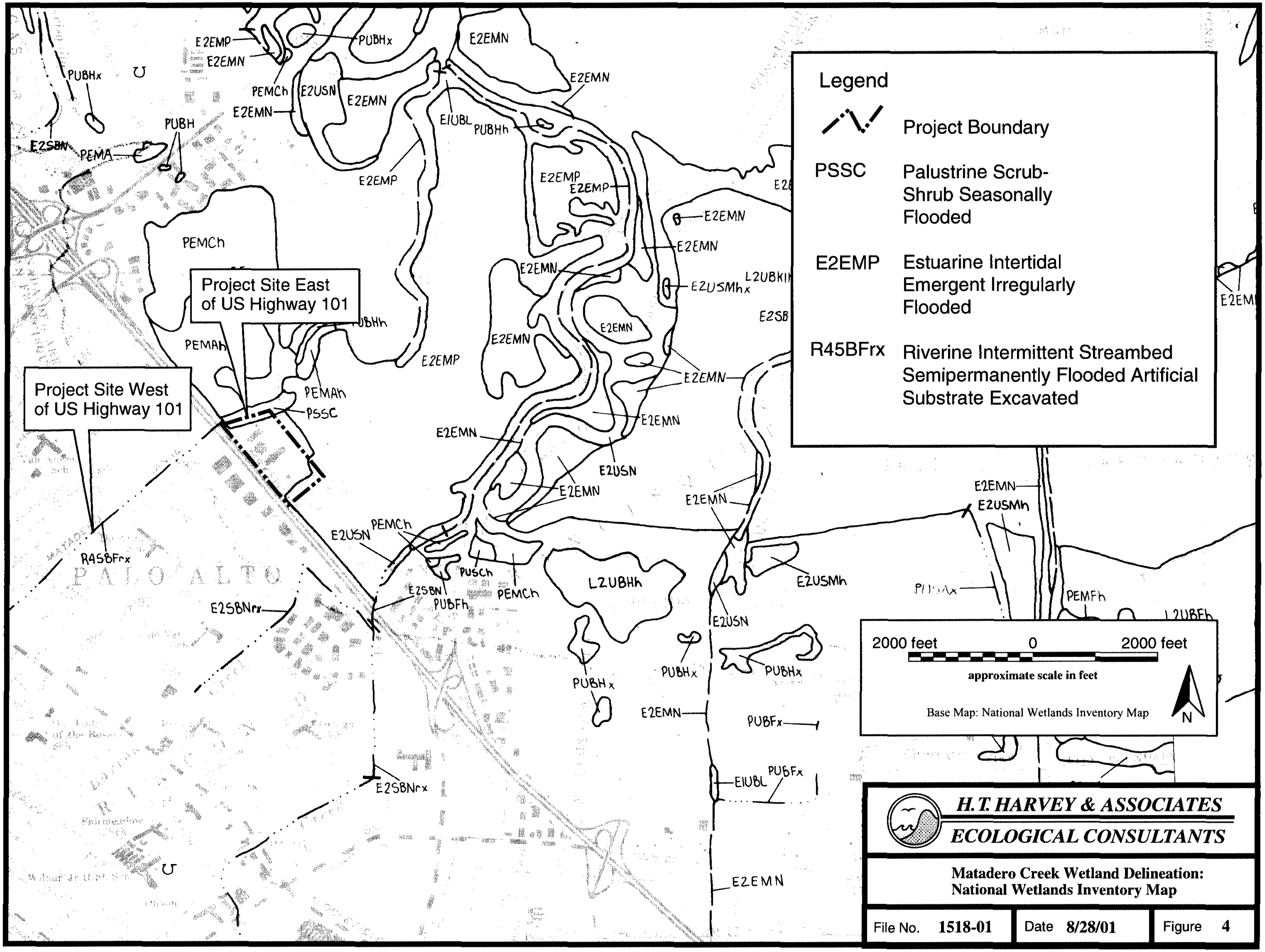
Matadero Creek Wetland Delineation: Soils Map

File No. **1518-01**	Date **8/28/01**	Figure **3**


Legend
Project Boundary
PSSC Palustrine Scrub-Shrub Seasonally Flooded
E2EMP Estuarine Intertidal Emergent Irregularly Flooded
R45BFrx Riverine Intermittent Streambed Semipermanently Flooded Artificial Substrate Excavated
Project Site East of US Highway 101
Project Site West of US Highway 101
2000 feet
0
2000 feet
approximate scale in feet
Base Map: National Wetlands Inventory Map
N
PALO ALTO
E2EMP
E2EMN
PUBHx
PEMCh
E2USN
E1UBL
PUBHh
E2SBN
PEMA
PUBH
PEMAh
PSSC
R45BFrx
E2SBNrx
PUSCh
PUBFh
L2UBHh
E2USMhx
E2USMh
L2UBKh
PUBFx
PEMFh
L2UBFh

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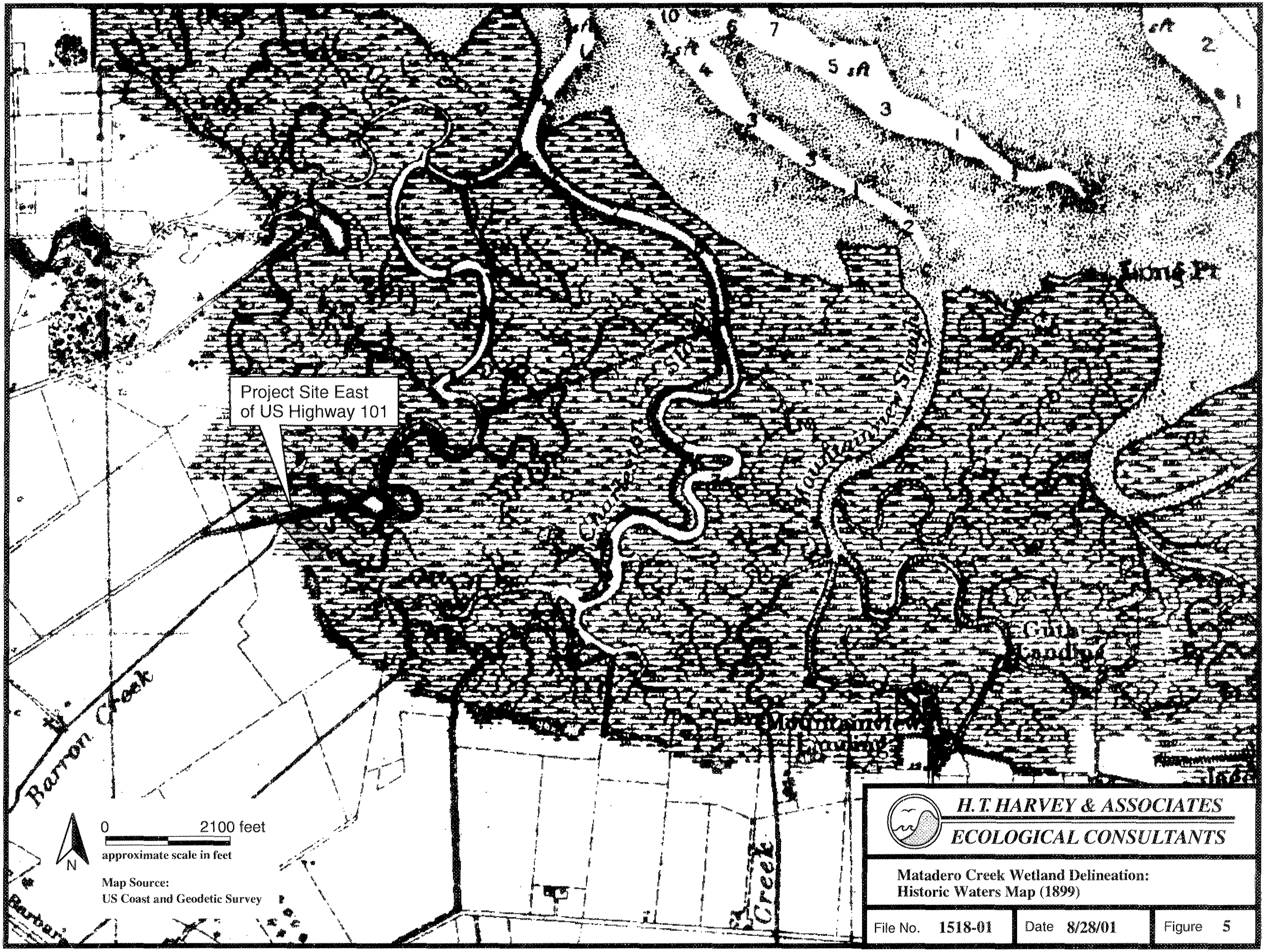
Matadero Creek Wetland Delineation: National Wetlands Inventory Map

File No. **1518-01** Date **8/28/01** Figure **4**



Map Source:
US Coast and Geodetic Survey

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Matadero Creek Wetland Delineation:
Historic Waters Map (1899)

File No.	**1518-01**	Date	**8/28/01**	Figure	**5**

Generally, surveys conducted on non-disturbed sites examine the vegetation, soils, and hydrology using the "Routine Determination Method," On-Site Inspection Necessary: (Section D) outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). This multi-parameter approach to identifying wetlands is based upon the presence of hydrophytic vegetation, hydric soils and wetland hydrology.

Alternatively, upland sites (non-wetlands) which subsequently developed some characteristics of wetlands, due to intentional or incidental human activities, are examined for wetlands using the techniques described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) for "Atypical Situations: Man-Induced Wetlands" (Section F, Subsection 4). The majority of such wetlands involve a significant change in the hydrologic regime, which may either increase or decrease the wetness of an area.

Prior to site surveys, topographic maps and aerial photographs of the study area were obtained from several sources and reviewed. These sources include the U.S. Geological Survey Map for the Mountain View Quadrangle (photo revised 1980), National Wetlands Inventory Map for the Mountain View Quadrangle, and aerial photographs contained in the *Soils Survey of Santa Clara County, California* (SCS 1968).

A brief overview of the USACE regulations specifically applicable to the identification of jurisdictional waters on the Matadero Creek project site and general guidance regarding the acquisition of permits for the proposed activities within these jurisdictional waters are summarized below.

Waters of the U.S. Regulations Overview. Areas meeting the regulatory definition of "Waters of the United States" are subject to the regulatory jurisdiction of the USACE. The USACE, under provisions of Section 404 of the Clean Water Act (1972), has jurisdiction over "Waters of the United States" (jurisdictional waters). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as "Waters of the U.S.", tributaries of waters otherwise defined as "Waters of the U. S.," the territorial seas, and wetlands adjacent to "Waters of the U.S." (33 CFR, Part 328, Section 328.3).

Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially-irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 CFR, Part 328).

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must be in compliance with permit requirements of the USACE. No USACE permit will be approved in the absence of state water quality certification pursuant to Section 401 of the Clean Water Act. State Water Resources Control Board is the state agency charged with implementing water quality certification in California.

Below we provide a detailed description of the methodology used in the identification of four different classes of jurisdictional waters, having the potential of occurring on site, including: A) Section 404 jurisdictional special aquatic sites, including wetlands, B) Section 404 tributary waters, C) Section 404 "other waters," and; D) Historical and Current Section 10 waters.

A) Identification of Section 404: Special Aquatic Sites; Including Jurisdictional Wetlands.

Special aquatic sites include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. The methodology employed in the determination of the single class of special aquatic sites observed within the project boundaries are described below.

Potential Jurisdictional Wetlands. Surveys were conducted within the project boundaries for areas that meet the technical criteria of potential jurisdictional wetlands. The vegetation, soils, and hydrology of the site were examined following the guidelines outlined in the "Routine Determination Method" in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

The property was examined for topographic features, drainages, alterations to site hydrology and areas of significant recent disturbance by hiking the entire site. A determination was then made as to whether normal environmental conditions were present at the time of the field surveys. Data were used to document which portions of the site were wetlands.

Vegetation. Plants observed at each of the sample sites were identified to species using standard floras appropriate for central California, wherever necessary. Such floras included *A California Flora and Supplement* (Munz and Keck 1968), *A Flora of the Marshes of California* (Mason 1969), *Manual of the Grasses of the United States* (Hitchcock 1971), and *Weeds of California* (Robbins, et al. 1970). The wetland indicator status of each species was obtained from the *1988 Wetland Plant List, California* (Reed 1988). The names of plants were generally not taken from *The Jepson Manual* (Hickman 1993) as these names are not totally consistent with scientific names used in the *1988 Wetland Plant List, California* (Reed 1988), and the *National List of Scientific Plant Names* (Smithsonian Inst. 1982). A list of species for each observation area was then compiled and an assessment of the dominant species made (Appendix A). It was then determined which of the observation areas supported wetland vegetation.

Wetland indicator species are so designated according to their frequency of occurrence in wetlands. For instance, a species with a presumed frequency of occurrence of 67% to 99% in wetlands is designated a facultative wetland indicator species. The wetland indicator groups, indicator symbol and the frequency of occurrence of species within them in wetlands are shown in Table 1.

Table 1. Wetland Indicator Status Categories for Vascular Plants*

INDICATOR CATEGORY	SYMBOL	FREQUENCY OF OCCURRENCE
OBLIGATE	OBL	greater than 99%
FACULTATIVE WETLAND	FACW	67 - 99%
FACULTATIVE	FAC	34 - 66%
FACULTATIVE UPLAND	FACU	1 - 33%
UPLAND	UPL	less than 1%

* Based upon information contained in *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Obligate and facultative wetland indicator species are hydrophytes that occur "in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). Facultative indicator species may be considered wetland indicator species when found growing in hydric soils that experience periodic saturation. A complete list of the vascular plants of the project area and their current indicator status has been provided in Appendix A.

Soils. Where possible, the top 22 inches of the soil profile was examined for hydric characteristics. Such characteristics include the presence of organic soils (Histosols), histic epipedons, aquic or peraquic moisture regime, presence of soil on hydric soil list, mottling indicated by the presence of gleyed or bright spots of colors (in the former case, blue grays; in the latter case, orange red, or red brown) within the soil horizons observed. Mottling of soils usually indicates poor aeration and lack of good drainage. Munsell Soil Notations (Munsell Soil Color Charts, Kollmorgen Instr. Corp. 1990) were recorded for the soil matrix for each soil sample. The last digit of the Munsell Soil Notation refers to the chroma of the sample. This notation consists of numbers beginning with 0 for neutral grays and increasing at equal intervals to a maximum of about 20. Chroma values of the soil matrix which are one (1) or less, or of two (2) or less when mottling is present, are typical of soils which have developed under anaerobic conditions.

In sandy soils, such as alluvial deposits in the bottom of drainage channels, hydric soil indicators include high organic matter content in the surface horizon and streaking of subsurface horizons by organic matter. All soil colors indicated in this report were taken under clear, sunny skies using moistened soil samples.

The *Soils Survey of Santa Clara County, California* (SCS 1968) was consulted in order to determine which soil types have been mapped on the project site. Descriptions of soil mapping units and the list of hydric soils in Santa Clara County are included in Appendix B.

Hydrology. Each of the sample sites was examined for positive field indicators of wetland hydrology. Such indicators might include visual observation of inundation and/or soil saturation, water marks, drift lines, water-borne sediment deposits, water-stained leaves, and drainage patterns within wetlands.

B) Identification of Section 404: Tributary Waters

Tributary waters and their impoundments are under the regulatory jurisdiction of the USACE and extend to the ordinary high water (OHW) mark on opposing channel banks in non-tidal areas and to the high tide line (HTL) in tidal areas. The OHW mark is typically indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in character of soil, destruction of vegetation, exposed roots on the bank, deposition of leaf litter and other debris materials or lower limit of moss growth on channel banks.

C) Identification of Section 404: "Other Waters"

"Other waters" include lakes, seasonal ponds, and seasonal springs. Such areas are identified by the presence of standing or running water and generally lack hydrophytic vegetation. The project site was surveyed for areas meeting the regulatory definition of "other waters."

D) Identification of Historical and Current Section 10 Waters

Historic maps and aerial photographs that included the project site were reviewed to determine if portions of the site occur within Section 10 waters. This information included: 1) U. S. Fish and Wildlife Service National Wetland Inventory Map for the Mountain View USGS Quadrangle (1985); 2) U. S. Coast and Geodetic Survey Charts for 1862 and 1899; 3) and an 1964 aerial photograph from the *Soil Survey of Santa Clara County, California* (SCS 1968),

Current Section 10 Waters in tidal waters includes tidal channels and adjacent special aquatic sites up to the limit of the mean high water mark (MHW) in areas currently exposed to fully tidal or muted-tidal action.

Historical Section 10 Waters occur behind levees, are currently not exposed to tidal or muted-tidal influence, and meet certain criteria. These criteria include: 1) the area is presently at or below mean high water (MHW); 2) the area was historically at or below MHW in its "unobstructed, natural state", and; 3) there is no evidence that the area was ever above MHW (Fong 1983).

Procedures for determining Historical Section 10 jurisdiction behind levees are as follows:

1. First, determine present MHW for the area in question.
    a. Use surveyed elevation data from the prospective applicant.
    b. If elevation data are not available, use the survey technique for determining MHW on the outboard side of the dike and project the MHW line back to the area in question.

    c. Those areas behind dikes that are presently above MHW are not subject to Section 10 permit requirements (provided they were above MHW prior to 28 January 1972 or were filled to above MHW thereafter under USACE permit) because they are presently at or above MHW.
    d. Those areas that are presently at or below MHW may be subject to Section 10 permit requirements. To determine whether these areas are subject to Section 10, two additional facts must be obtained (which are numbers 2 and 3 of the historical waters definition provided above).

2. The second step is to determine whether those areas presently at or below MHW were historically below MHW before the dikes were built.
    a. If available, use elevation data that were surveyed just prior to or just after the dikes were built. More often then not, this information is not available but potential sources include city and county planning commissions, public works departments, Caltrans, State Lands Commission, etc.
    b. If historic elevation data are not available, use the T-charts of 1850-90 to determine the location of the historic sloughs, if any, in those areas that are presently below MHW. The premise is that the historic sloughs were subject to the ebb and flow of the tides, and thus were below MHW.
    c. Those areas presently below MHW and historically below MHW as determined by elevation data or T-charts would be considered at or below MHW historically.
    d. Areas that were historically below MHW and filled above MHW (as shown by reliable data) but due to subsidence are now below MHW are not subject to Section 10 authority, but may be subject to Section 404 jurisdiction.

The mean high water (MHW) elevation in Matadero Creek was identified at 3.10 feet NGVD. A table with tide characteristics and elevations (in NGVD and MLLW) is provided in the Matadero and Barron Creeks Remediation Project Engineering Report Appendix G (Schaaf & Wheeler 2001, Table G-1).

SURVEY RESULTS

SUMMARY OF FINDINGS

Jurisdictional waters subject to provisions of Section 404 of the Clean Water Act were identified within the project boundaries (Figures 6 and 7). Approximately 2.076 acres of jurisdictional waters, including wetlands (1.404 acres), tributary waters (0.604 acres), and other waters (0.068 acres) were identified on site. Jurisdictional waters subject to provisions of Historical and Current Section 10 of the Rivers and Harbors Act were identified within the project boundaries east of U.S. Highway 101 and totaled 0.533 acres.

Information pertinent to the identification of jurisdictional waters assembled during the investigations is presented in four appendices attached to the rear of this report.

- Appendix A - Plant List
- Appendix B - Soils Descriptions
- Appendix C - USACE Data Forms
- Appendix D - Color Photographs

OBSERVATIONS / RATIONALE / APPROACH / ASSUMPTIONS

- The 3-parameter, routine determination method was used to identify potential wetlands on site. Normal conditions were assumed.

- Several feet of standing water was observed in the channel of Matadero Creek east of U.S. Highway 101 during the August 2001 site visits (Photograph 1; Appendix D). Matadero Creek is hydrologically connected to Mayfield Slough and the Palo Alto Flood Basin.

- Two different types of potentially jurisdictional wetlands including seasonal freshwater marsh and coastal salt marsh occur within the Matadero Creek project site east of U.S. Highway 101. The seasonal freshwater marsh on site receives water largely from Matadero Creek, particularly during the winter rainfall period, however, the high water tables associated with the San Francisco Bay also contribute subsurface hydrology to the southernmost portion of this marsh on site.

- Coastal salt marsh habitat on site occurs within the Palo Alto Flood Basin (Photographs 2 and 3; Appendix D). The Palo Alto Flood Basin is a highly managed system surrounded by levees. Sixteen gated culverts control the flow of water from the San Francisco Bay into the Palo Alto Flood Basin. The basin retains water from winter storm events and releases water into the bay via the gated culverts during low tide. During the dry summer period, a single gate remains open in the northeast quadrant of the site allowing water to flow into the basin during high tide events. In addition, because of the basin's direct proximity to the San

Francisco Bay, high water tables also contribute significant hydrology to coastal salt marsh wetlands on site.

- Approximately 12 sample points were taken throughout the study area east of U.S. Highway 101. Information regarding field characteristics at each of the sample points was entered onto USACE Data Forms presented in Appendix C of this report.

- Hydrologic monitoring consisting of numerous monthly site visits to observe the presence of standing water within seasonal freshwater marsh habitat occurred during the months of January through May 2000 (Photographs 4-7; Appendix D). This portion of the project site is located within the Matadero Creek floodplain east of U.S. Highway 101. The majority of these potential jurisdictional wetlands that are located in the western central portion of the site occur beneath a dense canopy of willow riparian vegetation on Alviso clay soils. The hydrology supporting these seasonal wetlands originates from a partial breach in the upper portion of the south bank of the Matadero Creek low-flow channel on site. Freshwater from the creek is conveyed through this breach into the seasonal wetlands only during high-flow winter storm events. Ponded water several inches deep was observed within these potential jurisdictional wetlands throughout most of the four-month winter monitoring period. No surface water or saturated soil conditions was observed in these wetlands during August 2001. In sharp contrast, the elevated floodway situated between the breach and U.S. Highway 101 only receives water during high storm events.

- Numerous small patches of hydrophytic vegetation occur on Matadero Creek west of U.S. Highway 101 at the Louis Road Bridge crossing. The hydrophytes occur along the toe-of-slope within the concrete-lined Matadero Creek channel (Photograph 8; Appendix D). These patches of hydrophytes were too small to map and are subject to removal through scouring and erosion on an annual basis during winter storm events.

AREAS MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS

Areas of the project site potentially subject to provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act are described below in the following section.

The remaining areas of the site met none of the regulatory definitions of jurisdictional waters under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

A) Identification Jurisdictional Wetlands (Special Aquatic Sites)

Potential jurisdictional wetlands on the project site east of U.S. Highway 101 are shown in Figure 6 (rear pocket). The total area of potential jurisdictional wetlands is approximately 1.404 acres. Two categories of wetlands were observed on site; seasonal freshwater marsh located in the central and southern portions of the site and coastal salt marsh in the extreme southern portion of the site.

As previously described, the seasonal freshwater marsh in the western central portion of the site appears to be largely associated with a partial breach in the south bank of the Matadero Creek low-flow channel. Surface and subsurface hydrologic conditions were monitored within these potential jurisdictional wetlands between January and May 2000. Seasonal freshwater marsh in the southern central portion of the site appears to be associated with the Palo Alto Flood Basin, and high water tables of the San Francisco Bay. Sample Points 1A, 2A, and 3A were collected within the seasonal freshwater marsh (Appendix C).

Coastal salt marsh within the project area occurs exclusively within the Palo Alto Flood Basin. Sample Points 4A, 5A, and 6A, were collected within the coastal salt marsh habitat (Appendix C).

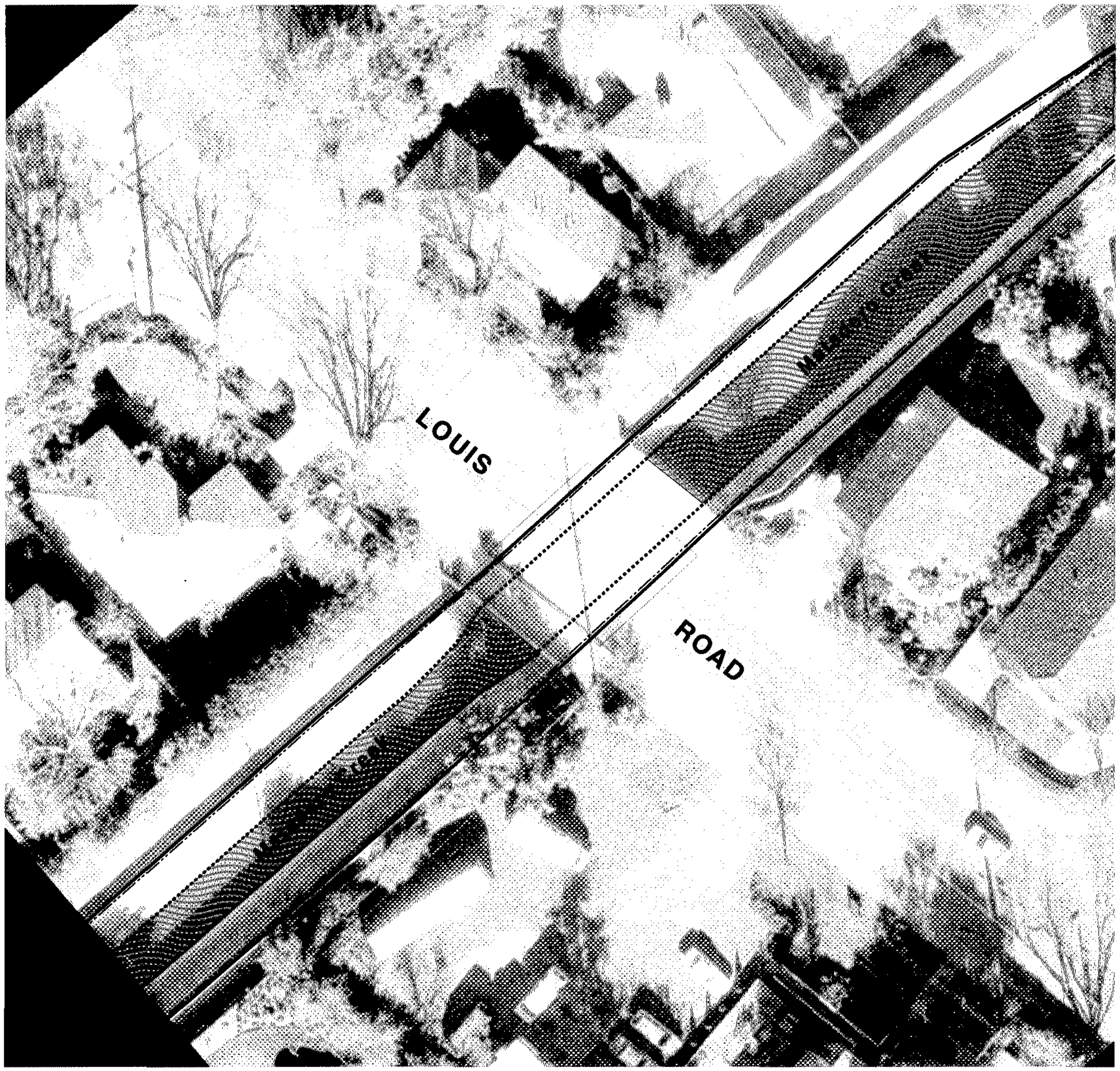
Hydrophytic Vegetation. Dominant hydrophytic vegetation in the freshwater marsh habitat included willow dock (*Rumex salicifolius*; OBL), tall umbrella sedge (*Cyperus eragrostis*; FACW), narrow-leaved cattail (*Typha angustifolia*; OBL), poison hemlock (*Conium maculatum*; FACW), and spear oracle (*Atriplex patula*; FACW). Dominant hydrophytic vegetaion in coastal salt marsh habitat included common pickleweed (*Salicornia virginica*; OBL), alkali bulrush (*Scirpus robustus*; OBL), and alkali heath (*Frankenia salina*; FACW).

Wetland Hydrology. Primary indicators of hydrologic characteristics included inundation and saturation, seeping and flowing water, algal mats and matted vegetation, oxidized root channels and drainage patterns within wetlands.

Hydric Soils. Hydric soil characteristics included soils of low chroma (10YR 3/1, 10YR 3/2, 2.5Y 3/1 and 2.5Y 4/2), and mottling (2.5YR 3/3, and 2.5 YR4/1).

B) Identification of Tributary Waters

Tributary waters located within the project site are shown in Figures 6 and 7. The project site includes tributary waters confined within Matadero Creek in each of the two portions of the site. Tributary waters located west of U.S. Highway 101 at the Louis Road Bridge crossing occur within the concrete-lined channel of Matadero Creek (Photograph 8; Appendix D). The total area of potential tributary waters is approximately 0.071 acres. Tributary waters located east of U.S. Highway 101 occur within the natural earthen lined channel of Matadero Creek (Photograph 1; Appendix D). The total area of tributary waters is approximately 0.533 acres, which overlaps with Section 10 jurisdictional waters (Table 2). The functional hydrology of Matadero Creek conveys water from the east side of the lower Santa Cruz Mountains originating near Los Altos Hills, through the City of Palo Alto, and into the Mayfield Slough located less than one-half mile east of U.S. Highway 101. The majority of Matadero Creek conveys water only during the fall and winter rainfall months, however, the downstream portion of the channel east of U.S. Highway 101 near Mayfield Slough is filled with water throughout the year. This portion of Matadero Creek and Mayfield Slough are within the tidal influence of the San Francisco Bay.



Legend

—— Project Boundary

Potential Jurisdictional Waters of the U.S.

▨ Section 404 Tributary Waters

-·—·-·— Limit of CDFG Jurisdiction

········· Ordinary High Water Mark

N

0 50 100

approximate scale in feet

H.T. HARVEY & ASSOCIATES

ECOLOGICAL CONSULTANTS

Matadero Creek Wetland Delineation:
Identification of Waters of the U.S.

File No. **1518-01**	Date **8/28/01**	Figure **7**

C) Identification of "Other Waters"

Other waters located on the project site east of U.S. Highway 101 are shown in Figure 6. Several separate bodies of other waters occur in the extreme southeast portion of the site within the City of Palo Alto Flood Basin (Photograph 7; Appendix D). The total area of other waters is approximately 0.068 acres. The other waters are associated with the diked coastal salt marsh habitat on site.

D) Identification of Historical and Current Section 10 Waters

The project site east of U.S. Highway 101 includes approximately 0.533 acres of Historical and Current Section 10 waters (Figure 6). This area is comprised of the Matadero Creek channel as described above, and overlaps with the Section 404 Tributary Waters acreage (Table 2).

In the absence of reliable historic elevation data for the study area east of U.S. Highway 101 taken prior to the construction of the flood control protection levees in the southeastern portion of the site, the full extent of Historical and Current Section 10 Waters of the U.S. is approximated by the location of historic sloughs presented in a T-chart taken from 1899 (Figure 5). Based on this analysis, the approximately 0.533 acres of Section 404 tributary waters associated with Matadero Creek are also included within Historical and Current Section 10 jurisdictional waters (Table 2).

AREAS NOT MEETING THE REGULATORY DEFINITION OF JURISDICTIONAL WATERS

The remainder of the project site does not meet the regulatory definition of jurisdictional waters. Data from upland areas within the project site east of U.S. Highway 101 was collected at SamplePoints 1B, 2B, 3B, 4B, 5B, and 6B (Appendix C). Sample Points 1B, 2B, and 3B occur within the Matadero Creek floodplain, and are dominated by non-native ruderal upland species. Sample Points 4B, 5B, and 6B occur within upland habitat adjacent to coastal salt marsh. Dominant grasses and forbs observed throughout these areas on site included ripgut grass (*Bromus diandrus*; NOL), smilo grass (*Piptatherum miliceum*; NOL), wild radish (*Raphanus sativus*; NOL), greater periwinkle (*Vinca major*; NOL), common sow thistle (*Sonchus oleraceus*; NI), poison hemlock (*Conium maculatum*; FACW), black mustard (*Brassica nigra*; NOL), bristly ox-tongue (*Picris echioides*; FAC).

Soils within these upland areas were generally of low chroma values (*i.e.*, 10YR 3/2, and 10YR 4/2) with occasional faint mottling. Much of the upper 18-24 inches of upland soils consisted of imported fill material associated with the maintenance of the south bank of the Matadero Creek channel, and developed areas located along the southern border of the project site. The low chroma values with occasional faint mottling encountered within these upland areas of the project site are believed to be from repeated wetting that occurs within the Matadero Creek floodplain, and historical hydrologic conditions at a time when this portion of the site was influenced by tidal events associated with the San Francisco Bay.

Tables 2 and 3 summarize the total amount of jurisdictional waters on each site.

Table 2. Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site East of U.S. Highway 101, Santa Clara County, California

HABITATS	ACRES
Current Section 404-Jurisdictional Waters:	
Tributary Waters	0.533
Wetlands	1.404
Other Waters	0.068
Total Section 404-Jurisdictional Waters	**2.005**
Current Section 10-Jurisdictional Waters	(0.533) overlaps with tributary waters
Historic Section 10-Jurisdictional Waters	(0.533) overlaps with tributary waters
TOTAL	**2.005**

Table 3. Summary of Potential Jurisdictional Waters of the Matadero Creek Project Site West of U.S. Highway 101, Santa Clara County, California

HABITATS	ACRES
Current Section 404-Jurisdictional Waters:	
Tributary Waters	0.071
Total Section 404-Jurisdictional Waters	**0.071**
Current Section 10-Jurisdictional Waters	None
Historic Section 10-Jurisdictional Waters	None
TOTAL	**0.071**

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APPENDIX A.

PLANTS OBSERVED ON THE MATADERO CREEK FLOOD CONTROL PROJECT AREA

Appendix A. Vascular Plants Observed at the Matadero Creek Flood Control Project Site, Palo Alto, California.			
FAMILY NAME	**SCIENTIFIC NAME**	**COMMON NAME**	**INDICATOR STATUS**
Apiaceae	*Conium maculatum*	poison hemlock	FACW
	Foeniculum vulgare	sweet fennel	FACU
Apocynaceae	*Nerium oleander*	oleander	NOL
	Vinca major	Greater periwinkle	NOL
Araliaceae	*Hedera helix*	English ivy	NOL
Arecaceae	*Washingtonia* sp.	fan palm	---
Asteraceae	*Achillea millefolium*	common yarrow	FACU
	Artemisia douglasiana	California mugwort	FACW
	Aster sp.	aster	---
	Baccharis pilularis	coyote brush	NOL
	Centaurea calcitrapa	pink star-thistle	NOL
	Centaurea solstitialis	yellow star-thistle	NOL
	Cirsium vulgare	bull thistle	FACU
	Conyza canadensis	horseweed	FAC
	Grindelia stricta var. *angustifolia*	marsh gumplant	FACW
	Picris echioides	bristly ox-tongue	FAC+
	Senecio mikanioides	German ivy	NOL
	Silybum marianum	milk thistle	NOL
	Sonchus oleraceus	common sow thistle	NI
Brassicaceae	*Brassica nigra*	black mustard	NOL
	Raphanus sativus	wild radish	NOL
	Rorippa nasturtium-aquaticum	water cress	NOL
Caprifoliaceae	*Sambucus mexicana*	blue elderberry	FAC
Chenopodiaceae	*Atriplex triangularis*	spearscale	FACW
	Beta vulgaris	beet	FACU
	Salicornia virginica	common pickleweed	OBL
	Salsola soda	glasswort	OBL
Cyperaceae	*Cyperus eragrostis*	tall umbrella sedge	FACW
	Scirpus robustus	alkali bulrush	OBL
Dipsacaceae	*Dipsacus sylvestris*	teasle	FACU
Hippocastanaceae	*Aesculus californica*	California buckeye	NOL
Juglandaceae	*Juglans hindsii*	Northern California black walnut	FAC
	Juglans regia	English walnut	NOL
Juncaceae	*Juncus* sp.	rush	---
Malvaceae	*Malva parviflora*	cheeseweed	NOL
Myoporaceae	*Myoporum laetum*	myoporum	NOL
Myrtaceae	*Eucalyptus* sp.	eucalyptus	---
Oxalidaceae	*Oxalis corniculata*	creeping oxalis	FACU

Appendix A. Vascular Plants Observed at the Matadero Creek Flood Control Project Site, Palo Alto, California.

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
Pinaceae	*Pinus* sp.	pine	---
Poaceae	*Arundo donax*	giant reed	FACW
	Avena fatua	wild oat	NOL
	Bromus mollis	ripgut grass	NI
	Distichlis spicata	saltgrass	FACW
	Elytrigia pontica ssp. *pontica*	tall wheatgrass	NOL
	Hordeum hystrix	Mediterranean barley	FAC
	Lolium multiflorum	Italian ryegrass	FAC*
	Piptatherum miliaceum	smilo grass	NOL
Polygonaceae	*Rumex crispus*	curly dock	FACW-
	Rumex salicifolius	willow dock	OBL
Rosaceae	*Rubus vitifolius*	California blackberry	FACW
Salicaceae	*Populus fremontii* ssp. *fremontii*	Fremont cottonwood	FACW
	Salix laevigata	red willow	NOL
Typhaceae	*Typha angustifolia*	broad-leaved cattail	OBL

The species are arranged alphabetically by family name for all vascular plants encountered during the plant survey. Plants are also listed alphabetically within each family. In some cases, it was not possible to accurately identify a particular plant to the species level due to the absence of specific anatomic structures required for identification.

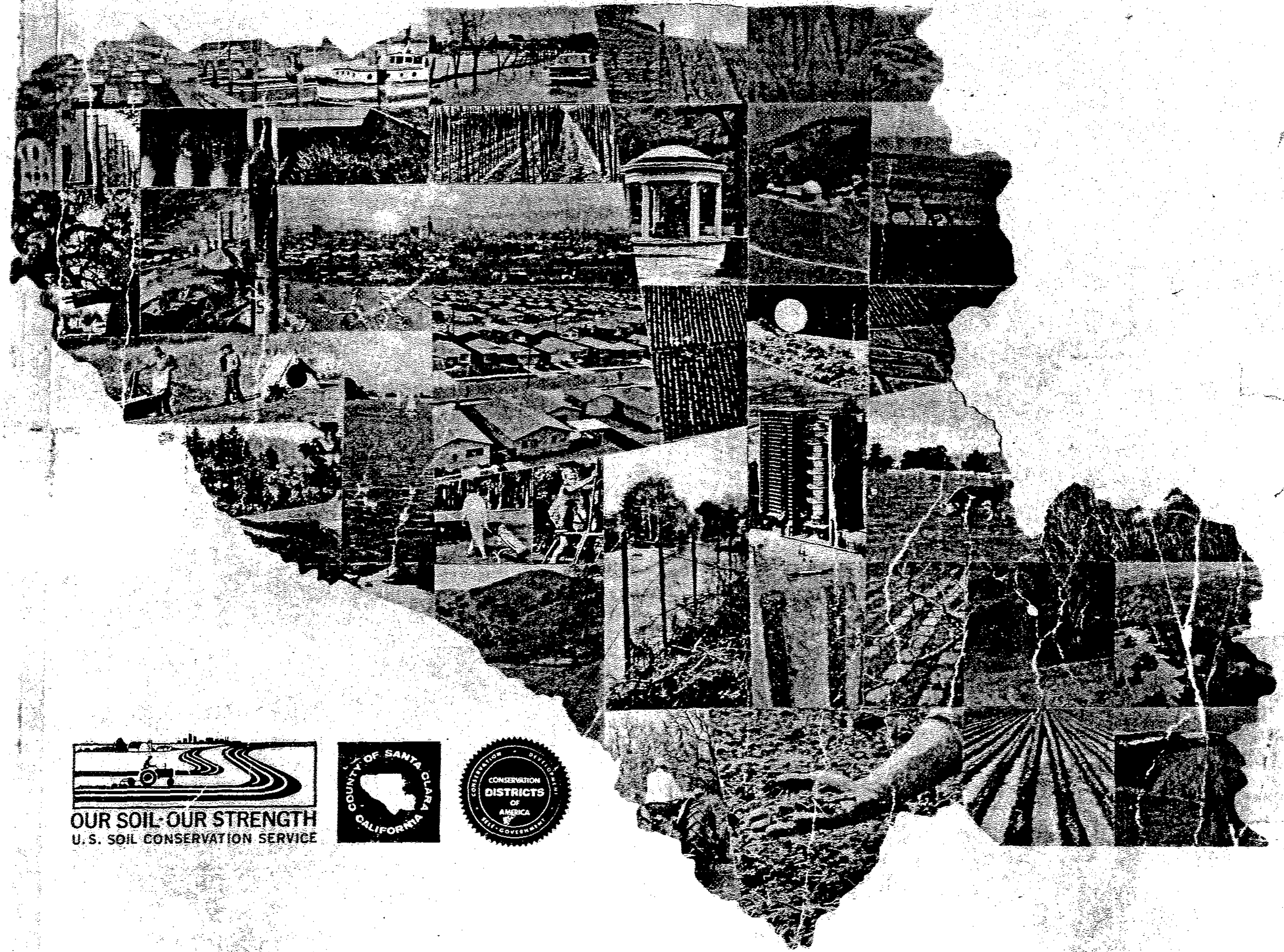
NOL = Not on List

APPENDIX B.

SOILS OF THE
MATADERO CREEK FLOOD CONTROL PROJECT AREA

PROPERTY OF
HARVEY & STANLEY ASSOCIATES, INC.

SOILS OF SANTA CLARA COUNTY



OUR SOIL·OUR STRENGTH
U.S. SOIL CONSERVATION SERVICE

Prepared by the United States Department of Agriculture, Soil Conserv
Service, in cooperation with and for the County of Santa Clara Pla
Department, the Santa Clara County Flood Control and Water District,
Black Mountain, Evergreen, and Loma Prieta Soil Conservation Di

DESCRIPTION OF THE SOILS

There are twenty soil associations shown on the General Soil Map for Santa Clara County. They are named by the major soil series occuring within each association. Some associations shown on the General Soil Map have the same soil series for which they are named, but differ by properties or qualities of major importance to use and management. These are separated (or phased) by indicating differences such as slope, erosion, coarse fragments, drainage, salt and alkali or surface texture.

The twenty soil associations for Santa Clara County are organized into five groups based on soil characteristics and qualities including slopes. The five major groups and the mapping units within each group are described as follows:

Group 1 - *Areas dominated by fine textured soils and land types influenced by tidal water.*

1 Alviso Association

This association consists of very poorly drained, fine textured soils developed in gleyed, fine textured alluvium. It occupies level tidal flats along the San Francisco Bay. Vegetation consists of water loving plants, saltgrasses and forbs. Elevations range from sea level to 10 feet. Mean annual rainfall is 15 to 16 inches; mean annual air temperature is 58 to 60° F. The growing season is 300 to 325 days. This association comprises less than 1 percent of the county.

Alviso soils make up 85 percent of this association; 10 percent of the included areas are soils strongly acid in reaction, and 5 percent is Tidal marsh land.

Alviso soils have dark gray clay surface soils and gleyed, gray silty clay subsoils. They overlie gleyed alluvium, mixed with layers of organic matter. Free water usually occurs at 1 to 3 feet from the surface. The soils are affected by high concentrations of salts.

These soils are used for limited pasture, wildlife, recreation and salt ponds. The soils are subject to flooding at high tides when not protected by levees.

2 Tidal marsh association

This association consists of miscellaneous Tidal marsh land. The area is periodically covered by tidal water. Vegetation is predominantly cordgrass, pickleweed or samphire. Numerous sloughs meander throughout this land type. This association comprises less than 1 percent of the county.

85 percent of this association is Tidal marsh land, and 15 percent is Alviso soils.

This association is used for wildlife, recreation and many areas have been ponded to evaporate sea water for the production of salt. It has no agricultural value.

Santa Clara County Photo

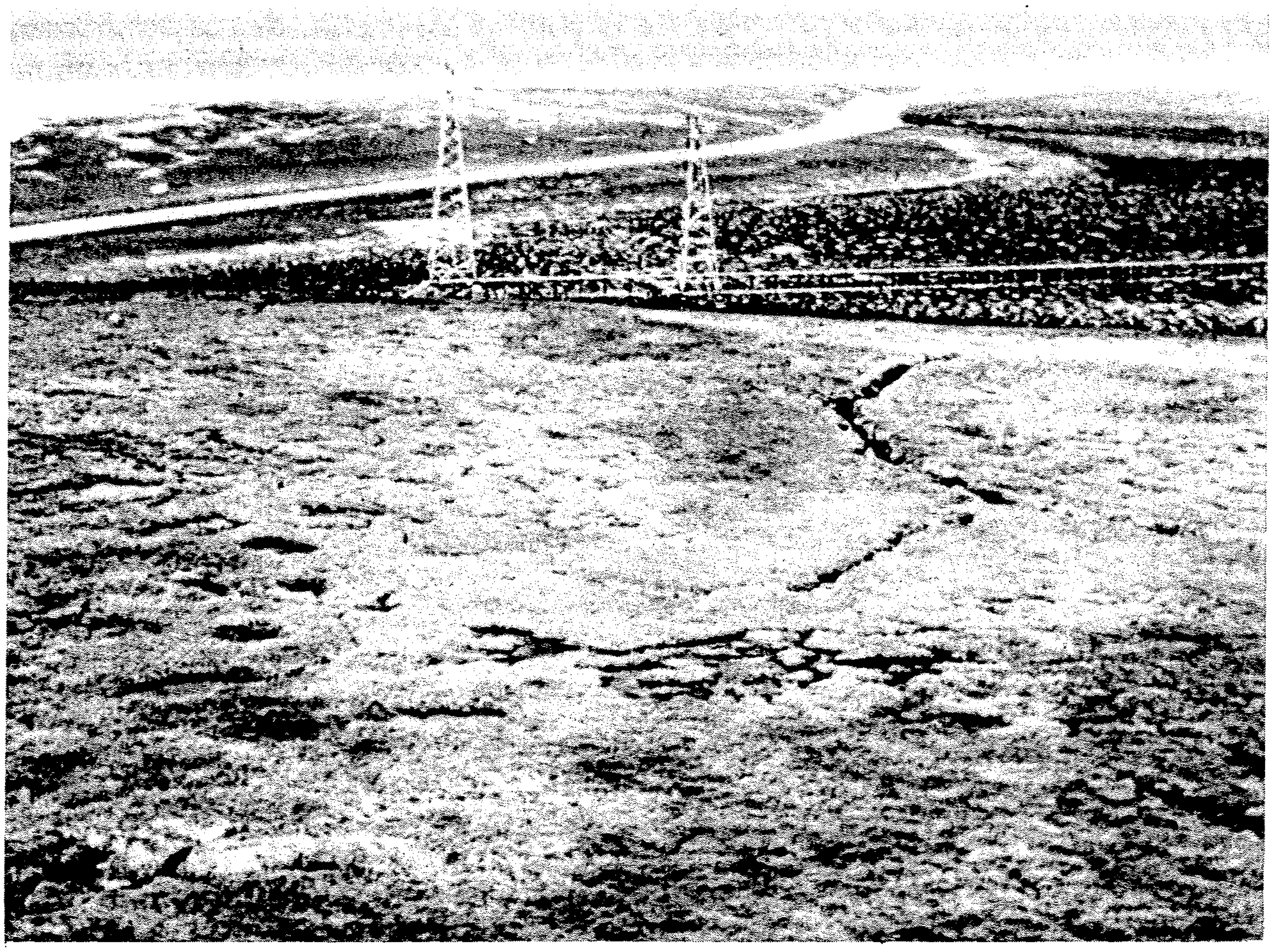


Figure (3) - *Marsh land is an important wildlife habitat. Provides food and resting area to migratory fowl and other birds of the Pacific Flyway.*

Group II - *Areas dominated by very deep, level, somewhat poor to poorly drained soils.*

3 Clear Lake-Campbell association, drained

This association consists of somewhat poor to poorly drained soils developed in mottled, fine to moderately fine textured alluvium. It occupies low level positions of the alluvial plains southeast of Gilroy, along Fisher Creek and Silver Creek, and small areas at other locations of the Santa Clara Valley. Vegetation consists of annual and perennial grasses and forbs. Elevations range from 130 to 300 feet. Mean annual precipitation is 16 to 20 inches; mean annual air temperature is 58 to 60° F. The growing season is 260 to 300 days. This association comprises about 1 percent of the county.

Clear Lake soils make up about 60 percent of this association and Campbell soils about 25 percent; 10 percent of the included areas are Cropley soils and 5 percent Pacheco soils.

Clear Lake soils have dark gray clay surface soils and mottled, grayish brown clay subsoils. Campbell soils have dark gray silty clay surface soils and olive gray silty clay loam subsoils. These soils overlie mottled, sedimentary alluvium. The intermittently high water table that existed during the development of these soils is below the zone that will affect crops at the present time.

These soils are used for irrigated row crops, sugar beets, orchards, dryland grain hay and pasture. Problems in the use of these soils are, fine textures and moderately slow to slow permeability. They have severe limitations for septic tank filter fields; shrink-swell behavior is moderate to high. These limitations impose restrictions on their use for housing and commercial developments.

4 Sunnyvale-Castro-Clear Lake association

This association consists of poorly drained soils, developed in mottled alluvium. It occupies low level positions of the alluvial plains on the valley floor extending from San Jose northwesterly to the Tidal marsh areas of San Francisco Bay and southeast of Gilroy. Elevations range from 30 to 300 feet. Mean annual precipitation is 16 to 20 inches; mean annual air temperature is 58 to 60° F. The growing season is 250 to 325 days. This association comprises about 3 percent of the county.

Sunnyvale soils make up about 40 percent of this association; Castro soils 25 percent and Clear Lake soils 20 percent. Included are 5 percent areas of Bayshore soils and 10 percent Willows soils.

Sunnyvale soils have dark gray, slightly calcareous silty clay surface soils and light gray, strongly calcareous subsoils. Castro soils have very dark gray, slightly calcareous clay surface soils and white, strongly calcareous clay subsoils. Clear Lake soils have dark gray clay surface soils and grayish brown clay subsoils. These soils overlie mottled, variable textured substrata. Free water usually occurs at 3 to 5 feet from the surface, except where artificially drained.

These soils are used for irrigated row crops, sugar beets, orchards, hay and pasture. Housing and commercial developments are rapidly expanding on these soils. Drainage and flood control are needed to achieve high production of most crops. These soils have moderate to severe limitations for septic tank filter fields; shrink-swell behavior is high. These limitations impose restrictions when used for housing and commercial developments.

Santa Clara County Photo

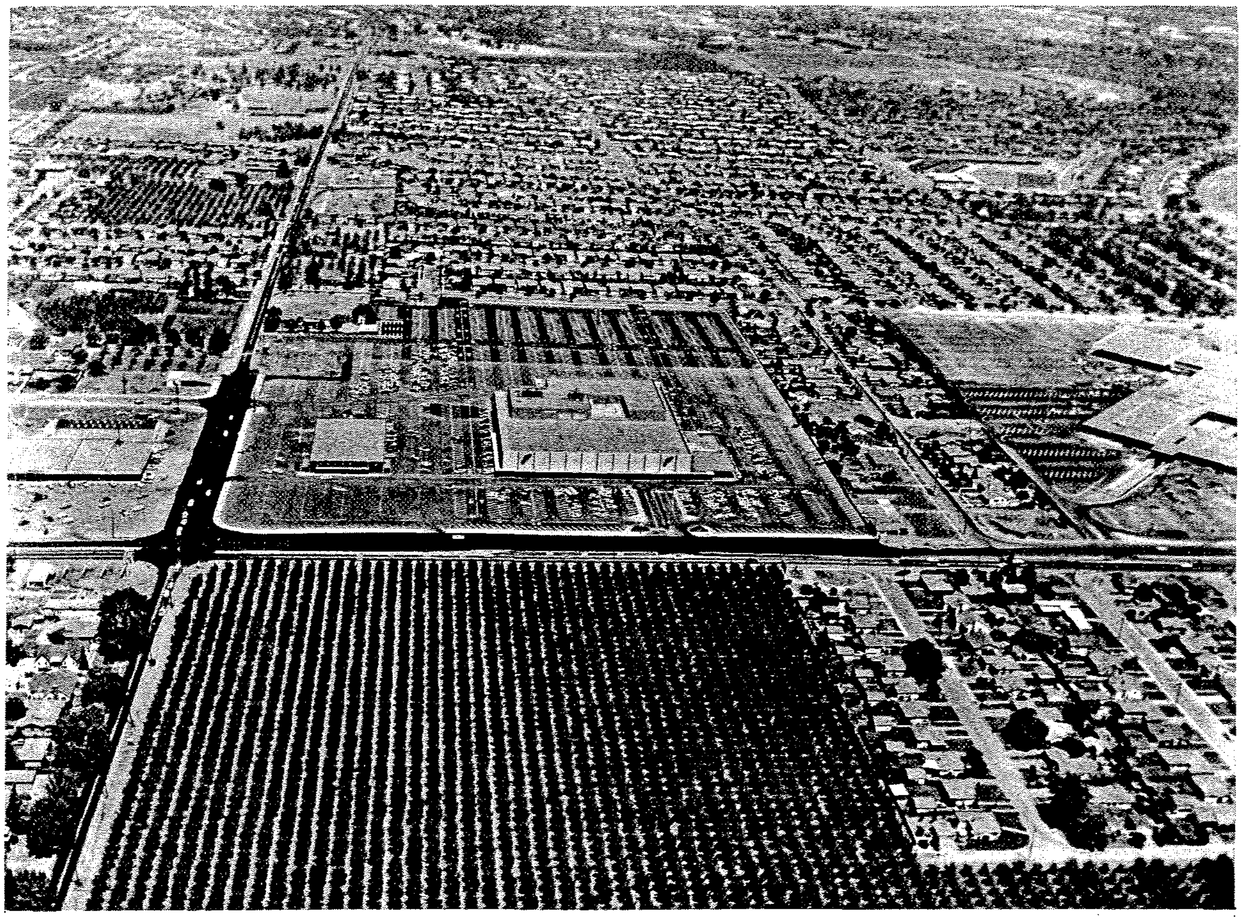


Figure (4) - *Land use change from agriculture to housing and commercial developments on Sunnyvale and Castro soils.*

Altamont clay 50 to 75 percent slopes, eroded (AcG2). This soil occurs as very steep areas with slopes of about 55 percent, associated with moderately steep areas of other Altamont soils. Because of moderate sheet erosion, depth to bedrock is 25 to 35 inches, and occasionally rock outcrops are present. This soil holds about 5 to 6 inches of water plants can use. Erosion hazard is very high, surface runoff is very rapid. Otherwise, this soil is similar to Altamont clay, 30 to 50 percent slopes. Included in mapping are San Benito clay loam, 10 percent, and landslips, and areas where the subsoils and underlying materials are exposed.

This soil is used for range. Capability unit VIIe5 (15).Pasture and range site Clayey, very steep phase.

ALVISO SERIES

Alviso series consists of very poorly drained, fine textured soils, underlain by sedimentary alluvium. The soils formed on tidal flats. Vegetation is water-loving plants, saltgrasses and forbs. Elevations range from sea level to 10 feet. Mean annual rainfall is 15 to 16 inches; mean annual air temperature is 58 to 60° F. The growing season is 300 to 325 days. Sunnyvale and Castro are the principal associated soils.

The surface soil averages from 6 to 10 inches in thickness and is a dark gray clay. The subsoil is a gray silty clay ranging in thickness from 30 to 40 inches. The substratum is gray silty clay over layered basin sediments.

Alviso soils are used for pasture, wildlife, recreation and salt ponds. The soils are affected by high concentrations of both neutral and alkaline salts.

Alviso clay (An). This soil occupies level tidal flat positions.

Representative profile: 9/10 of a mile north on Morse Avenue, from Alviso Highway and 50 yards west into field along the levee; Santa Clara County, California.

Alg	0 to 8 inches, dark gray (N 4/) clay, very dark gray (N 3/) moist; few faint gray (N 6/) dry mottles; moderate medium angular blocky structure; hard, firm, sticky and plastic; abundant very fine and fine roots; few very fine interstitial, common very fine and few fine tubular pores; slightly calcareous, moderately alkaline (pH 8.0); clear smooth boundary. (6 to 10 inches thick).
Clg	8 to 38 inches, mixed gray and light gray (N5, N7); silty clay, dark gray (5Y 4/1) moist with common medium distinct olive (5Y 5/3) dry mottles; massive; very hard, friable, sticky and plastic; plentiful very fine roots; few very fine and fine tubular pores; slightly calcareous, moderately alkaline; clear smooth boundary. (30 to 40 inches thick).

IIIC2g 38 to 60 inches, gray (N-6) silty clay, dark gray (N 4/) moist; massive; very hard, firm, sticky and plastic; slightly calcareous, moderately alkaline (pH 8.0).

Surface soil color is gray or dark gray. Areas of the surface soil may be slightly calcareous and reaction may be neutral to moderately alkaline. Texture is clay, silty clay or silty clay loam. The surface soil is usually moist because of the presence of a water table at depths of 1 to 3 feet. A thin discontinuous organic layer, one inch or less in thickness may occur on the surface. Color of the subsoil is gray or light gray with brown and olive brown mottles. It is usually salty, calcareous and moderately alkaline. Texture will average a silty clay, but is stratified with silty clay loam, organic matter and sandy loam.

Included in mapping this soil are areas of similar soils, strongly acid in reaction 10 percent; and 5 percent Tidal marsh land.

This very poorly drained soil has a water holding capacity of 4 to 8 inches. Fertility is very low, because of high concentrations of both neutral and alkaline salts. Ponding occurs and the soils are subject to flooding at high tides where not protected by levees. Permeability of the subsoil is slow. The salty subsoil and water table restrict rooting depths at 1 to 3 feet.

This soil is used for pasture and range, wildlife, recreation and salt ponds. Capability unit IVw6 (14).

ARBUCKLE SERIES

The Arbuckle series consists of somewhat excessively drained, medium textured soils, underlain by sedimentary alluvium. These soils formed on nearly level to moderately sloping old fans and terraces. Vegetation is chiefly annual grasses and forbs, with a few scattered large oaks. Elevations range from 200 to 800 feet. Mean annual rainfall is 15 to 20 inches; mean annual temperature is 58 to 60° F. The growing season is 250 to 300 days. Pleasanton and San Ysidro are the principal associated soils.

The surface soil averages from 8 to 13 inches in thickness and is brown, slightly acid gravelly loam. The subsoil is a brown, slightly acid gravelly loam, ranging in thickness from 26 to 34 inches. The substratum consists of stratified very gravelly, cobbly alluvium.

Arbuckle soils are used for irrigated row crops, orchards, dryland grain hay, pasture and range.

Arbuckle gravelly loam, 0 to 2 percent slopes (ArA). This soil is nearly level with less than 2 percent average slope.

Representative profile: 1 and 3/4 miles east on Dunn Avenue from Southern Pacific railroad crossing and 200 yards north into field, in the N. W. 1/4 of the S. E. 1/4 of Sec. 22, T. 9 S., 3 E., Santa Clara County, California.

used as a source of sand and gravel. Capability unit VIIel (15); pasture and range site Loamy, steep phase.

SUNNYVALE SERIES

The Sunnyvale series consists of poorly drained, fine textured soils, underlain by gleyed sedimentary alluvium. They formed on low level positions of the alluvial plains. Vegetation is water-loving plants, annual grasses and forbs. Elevations range from 100 to 300 feet. Mean annual rainfall is 16 to 20 inches; mean annual air temperature is 58 to 60° F. The growing season is 250 to 325 days. Clear Lake and Campbell are the principal associated soils.

The surface soil averages 11 to 18 inches in thickness and is a dark gray, calcareous silty clay. The subsoil is a light gray and gray, strongly calcareous silty clay, ranging in thickness from 26 to 32 inches. The substratum is light gray mottled, slightly calcareous silty clay alluvium.

Sunnyvale soils are used for irrigated row crops, sugar beets, orchards and hay. Large areas are used for housing and commercial developments.

Sunnyvale silty clay, drained (Sv). This level soil occurs in low positions of the alluvial plains.

Representative profile: 100 feet west of the intersection of Santa Teresa and Laguna Road, 2 tree rows north in a prune orchard; Santa Clara County, California.

Apca	0 to 6 inches, dark gray (N4/) silty clay, very dark gray (N3/) moist; strong fine granular structure; hard, very friable, sticky and plastic; plentiful very fine roots or fine roots; many very fine interstitial pores; slightly calcareous with disseminated lime; moderately alkaline (pH 8.0); clear smooth boundary. (5 to 8 inches thick).
Al2ca	6 to 14 inches, dark gray (N4/) silty clay, very dark gray (N3/) strong fine subangular blocky structure; hard, friable, sticky and plastic; few fine roots; many very fine interstitial and tubular pores few fine tubular pores; calcareous with lime disseminated and in soft medium irregular masses, moderately alkaline (pH 8.0); gradual wavy boundary. (6 to 10 inches thick).
Clca	14 to 34 inches, light gray (N7/) silty clay, dark gray (N4/) moist; strong medium subangular blocky structure; very hard, friable, sticky and plastic; few fine roots; many very fine interstitial and tubular pores; very strongly calcareous, with lime disseminated, also, many large irregularly shaped soft masses and a few hard lime concretions; moderately alkaline (pH 8.0); gradual

wavy boundary. (18 to 22 inches thick).

C2ca 34 to 42 inches, gray (5Y 5/1) silty clay, dark gray (5Y 4/1) moist, with mottles many fine distinct light yellowish brown (2.5Y 6/4) dry, and light olive brown (2.5Y 5/4) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; many very fine interstitial and tubular pores; strongly calcareous, with lime disseminated, also many large irregularly shaped soft masses, moderately alkaline (pH 8.0); clear smooth boundary (8 to 10 inches thick).

C3g 42 to 60 inches, light gray (5Y 7/1) silty clay, gray (5Y 5/1) moist; with mottles, many fine distinct light yellowish brown (2.5Y 6/4) dry, and light olive brown (2.5Y 5/4) moist; massive; hard, friable, sticky and plastic; many very fine interstitial and tubular pores; weakly calcareous with disseminated lime moderately alkaline (pH 8.0).

Surface soil color is typically dark gray and the texture is silty clay. Reaction is moderately alkaline and calcareous with slight to moderate concentrations of disseminated lime. The subsoil color is typically gray or may be white. The strongly calcareous subsoil occurs at an average depth of 14 inches. Lime is disseminated, but there are many large soft irregularly shaped lime masses and a few hard lime concretions. Texture is a silty clay or silty clay loam.

Included in mapping this soil are 15 percent areas of Clear Lake clay; and a few small areas strongly calcareous on the surface.

Drainage is poor, but now improved because of the general lowering of ground water levels in the valley. Water may become ponded during winter months and the subsoil permeability is slow. Fertility is high. Average water holding capacity is about 9 to 10 inches. Rooting depth is very deep, but is somewhat limited by the highly calcareous subsoils.

This soil is used for irrigated row crops, sugar beets, prunes, and pears. About 50 percent is used for housing and commercial developments. Where orchard crops are grown, definite symptoms of chlorosis are present. Capability unit IIs5 (14).

Sunnyvale silty clay (Su). This nearly level soil is similar to Sunnyvale silty clay, drained, except for having a seasonal water table at depths of 30 to 60 inches; texture may be silty clay or silty clay loam. Near Tulare Hill, flooding may occur about twice in 10 years. Average water holding capacity is 6 to 8 inches and fertility is moderate. Included in mapping are a few spots that are highly calcareous; a few that are salty on the surface; about 5 acres just south of Tulare Hill of Pacheco silt loam, and a few acres of Willows clay. About 20 acres of this soil has black clay buried surface horizons at an average depth of 2 to 3 feet.

This soil is used for irrigated row crops and pasture. Drainage, irrigation management and flood control are the main management problems. Capability unit IIIw5 (14).

TERRACE ESCARPMENTS

Terrace escarpments (TeF). This miscellaneous land type consists of steep old terraces, usually with slopes of 30 to 50 percent. Keefers, Pleasanton and Hillgate are the principal associated soils. These areas have not developed distinct soil horizons but are generally gravelly loam or clay loam textured material. Runoff is rapid. Erosion hazard is high. Vegetation is mostly annual grasses, forbs and scattered oaks.

This land type is used for limited range, wildlife and watershed. Capability unit VIIe1 (15); pasture and range site Loamy, steep phase.

TIDAL MARSH

Tidal marsh (Tf). This miscellaneous land type consists of land that is periodically covered by ocean water. Vegetation is a rank growth of cordgrass and pickleweed. Numerous sloughs meander through out this land.

This land type is used for wildlife and recreation. Large areas have been ponded and used for evaporating sea water for the production of salt. Capability unit VIIIw6 (14).

VALLECITOS SERIES

The Vallecitos series consists of well drained soils having fine textured subsoils underlain by sedimentary and metasedimentary bedrock, at depths of about 19 inches. They formed on moderately steep to very steep uplands. Vegetation is annual grasses, forbs and oak trees. Elevations range from 300 to 3,500 feet. Mean annual rainfall is about 16 to 25 inches; mean annual air temperature is about 58 to 60° F. The growing season is about 200 to 250 days. Gaviota and Los Gatos are the principal associated soils.

The surface soil averages 5 to 10 inches in thickness and is a brown slightly and medium acid loam. The subsoil is dark brown and reddish brown, medium acid clay loam and clay, averaging 8 to 20 inches in thickness. The substratum is metamorphosed shale.

Vallecitos soils are used for dryland pasture, range, wildlife, recreation and watershed.

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
AcF	Altamont clay, 30 to 50 percent slopes		
AcE	Altamont clay, 15 to 30 percent slopes		
AcE2	Altamont clay, 15 to 30 percent slopes, eroded		
AcG2	Altamont clay, 50 to 75 percent slopes, eroded		
An	Alviso clay	Alviso (CA0141)	
ArA	Arbuckle gravelly loam, 0 tO 2 percent slopes		
AkC	Arbuckle loam, deep, 5 to 9 percent slopes		
AsE	Ayar clay, 15 to 30 percent slopes		
AsD	Ayar clay, 9 to 15 percent slopes		
AsF	Ayar clay, 30 to 50 percent slopes		
AuG	Azule clay loam, 30 to 75 percent slopes		
AuG2	Azule clay loam, 30 to 75 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
AvD2	Azule silty clay loam, 9 to 15 percent slopes, eroded		
AvE	Azule silty clay loam, 15 to 30 percent slopes		
AvE2	Azule silty clay loam, 15 to 30 percent slopes, eroded		
Ba	Bayshore clay loam	Bayshore (CA1337)	
BeG	Ben Lomond fine sandy loam, 50 to 75 percent slopes		
Ca	Campbell silty clay loam	Clear Lake (CA0013)	low alluvial plains
Cd	Campbell silty clay	Clear Lake (CA0013)	low alluvial plains
Cc	Campbell silty clay loam, clay substratum	Cambell (CA1356)	
Ce	Cambell silty clay, muck substratum	Cambell (CA1356)	
Cf	Castro clay		
Ch	Clear Lake clay drained	Cambell (CA1356) Sunnyvale (CA1381)	low bottoms alluvial plains
Cg	Clear [illegible] clay	Clear Lake (CA0013)	
Ck	Clear Lake clay saline	Clear Lake (CA1322)	

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
CmE	Climara stony clay, 15 to 50 percent slopes		
CnD	Climara clay, 9 to 30 percent slopes		
CoB	Cortina very gravelly loam, 0 to 5 percent slopes	River wash	drainage ways
CrA	Cropley clay, 0 to 2 percent slopes	Clear Lake (CA0013)	Depressions
CrC	Cropley clay, 2 to 9 percent slopes		
CsA	Cropley clay loam 0 to 2 percent slopes	Cambell (CA1356)	
DaD	Diablo clay, 9 to 15 percent slopes		
DaE	Diablo clay, 15 to 30 percent slopes		
DaE2	Diablo clay, 15 to 30 percent eroded		
DaF	Diablo clay, 30 to 50 percent slopes		
EsA	Esparto loam, 0 to 2 percent slopes		
EsC	Esparto loam, 2 to 9 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
FaG	Felton silt loam, 50 to 75 percent slopes		
FaE	Felton silt loam, 15 to 30 percent slopes		
FaF	Felton silt loam, 30 to 50 percent slopes		
FbG	Felton-Ben Lomond complex, 50 to 75 percent slopes		
GaA	Garretson loam, gravel substratum 0 to 2 percent slopes		
GbB	Garretson gravelly loam, 0 to 5 percent slopes		
GpA	Garretson fine sany loam, 0 to 2 percent slopes		
GcG	Gaviota loam, 30 to 75 percent slopes		
GcD2	Gaviota loam, 5 to 15 percent slopes, eroded		
GcE	Gaviota loam, 15 to 30 percent slopes		
GkE2	Gaviota rocky loam 5 to 30 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
GhG2	Gaviota gravelly loam, 30 to 75 percent slopes, eroded		
GhG3	Gaviota gravelly 30 to 75 percent slopes, serverly eroded		
GmE	Gaviota-Los Gates complex, 15 to 30 percent slopes		
GmF	Gaviota-Los Gates complex, 30 to 50 percent slopes		
GoF	Gilroy clay loam, 30 to 50 percent slopes		
GoD	Gilroy clay loam, 5 to 30 percent slopes		
GoE2	Gilroy clay loam, 15 to 30 percent slopes, eroded		
GoG	Gilroy clay loam, 50 to 75 percent slopes		
HeG3	Henneke rocky clay loam, 30 to 75 percent slopes, severely eroded		
HfD2	Hillgate silt loam, 9 to 15 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
HfC	Hillgate silt loam, 2 to 9 percent slopes		
HfE2	Hillgate silt loam, 15 to 30 percent slopes, eroded		
HfF2	Hillgate stilt loam, 30 to 50 percent slopes, eroded		
InG2	Inks rocky clay loam, 50 to 75 percent slopes, eroded		
IsG3	Inks stony clay loam, 30 to 75 percent slopes, severly eroded		
KeC2	Keefers clay loam 2 to 9 percent slopes, eroded	Un-named soils	seep and marsh areas
KeA	Keefers clay loam, 0 to 2 percent slopes	Un-named soils	seep and marsh areas
KfB	Kitchen middens		
LaF	Lanslides		
LfG	Los Gatos gravelly loam, 50 to 75 percent slopes		
LfE2	Los Gatos gravelly loam, 15 to 30 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
LfF	Los Gatos gravelly loam, 30 to 50 percent slopes		
LgE	Los Gatos clay loam, 15 to 30 percent slopes		
LgE2	Los Gatos clay loam, 15 to 30 percent slopes, eroded		
LhG	Los Gatos-Gaviota complex, 50 to 75 percent slopes		
LkG3	Los Gatos and Maymen soils, 50 to 75 percent slopes, severely eroded		
LoE	Los Osos clay loam, 15 to 30 percent slopes		
LoF	Los Osos clay loam 30 to 50 percent slopes		
LoG	Los Osos clay loam, 50 to 75 percent slopes		
LrA	Los Robles clay loam, 0 to 2 percent slopes		
LrC	Los Robles clay loam, 2 to 9 percent slopes		
LtD	Los Trancos stony clay, 15 to 30 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
Ma	Made land		
MbF	Madonna loam, 30 to 50 percent slopes		
MbE	Madonna loam, 15 to 30 percent slopes		
MbE2	Madonna loam, 5 to 30 percent slopes, eroded		
MbG	Madonna loam, 50 to 75 percent slopes		
McB	Maxwell clay, 0 to 5 percent slopes		
MfG2	Maymen rocky fine sandy loam, 50 to 75 percent slopes, eroded		
MeF2	Maymen fine sandy loam, 15 to 50 percent slopes, eroded		
Mg	Mocho loam		
Mh	Mocho clay loam		
Mk	Mocho soils, undifferentiated		
MwF2	Montara rocky clay loam, 15 to 50 percent slopes, eroded		
MxF3	Montara stony clay loam. 30 to 50 percent slopes, severely eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
MyE	Montara-Climara complex, 15 to 30 percent slopes		
Og	Orestimba silty clay loam	Orestimba	
Of	Orestimba clay loam	Orestimba	
Pd	Pacheco clay loam	Clear Lake (CA0013)	low alluvial plains
Pa	Pacheco fine sandy loam	Clear Lake (CA0013)	low alluvial plains
Pb	Pacheco silt loam, drained		
Pe	Pacheco clay loam, gravelly substratum	Pacheco (CA0048)	
Pf	Pacheco loams, clay substratum	Pacheco	small areas with high water tables
PgE	Parrish gravelly clay loam, 9 to 30 percent slopes		
PgF	Parrish gravelly clay loam, 30 to 50 percent slopes		
PgG	Parrish gravelly clay loam, 50 to 75 percent slopes		
Pg3	Permanente stony loam, 50 75 percent slopes, severely eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
PkG	Pits		
PoA	Pleasanton loam, 0 to 2 percent slopes		
PoC	Pleasanton loam, 2 to 9 percent slopes		
PpA	Pleasanton gravelly loam, 0 to 2 percent slopes		
PpC	Pleasanton gravelly loam, 2 to 9 percent slopes		
PpD2	Pleasanton gravelly loam, 9 to 15 percent slopes, eroded		
PpE2	Pleasanton gravelly loam, 15 to 30 percent slopes, eroded		
PrD	Positas-Saratoga loams, 9 to 15 percent slopes		
PrC	Positas-Saratoga loams, 2 to 9 percent slopes		
RaA	Rincon clay loam, 0 to 2 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
Rg	Riverwash	Riverwash	
RnG	Rock land		
SaG2	San Andreas fine sandy loam, 30 to 75 percent slopes, eroded		
SaE2	San Andreas fine sandy loam, 15 to 30 percent slopes, eroded		
SbG	San Benito clay loam, 50 to 75 percent slopes		
SbE2	San Benito clay loam, 15 to 30 percent slopes, eroded		
SbF	San Benito clay loam, 30 to 50 percent slopes		
SbF3	San Benito clay loam, 30 to 50 percent slopes, severely eroded		
ScG	Santa Lucia shaly loam, 50 to 75 percent slopes		
ScF2	Santa Lucia shaly loam, 30 to 50 percent slopes, eroded		
SdA	San Ysidro loam, 0 to 2 percent slopes	San Ysidro	Areas subjected to ponding
SdB2	San Ysidro loam, 2 to 9 percent slopes, eroded		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
SdD	San Ysidro loam, 9 to 15 percent slopes		
SeA	San Ysidro clay, overwash, 0 to 2 percent slopes		
SfA	San Ysidro loam, acid variant, 0 to 2 percent slopes		
SfC	San Ysidro loam, acid variant, 2 to 9 percent slopes		
SgC	Saratoga-Positas loams, 2 to 9 percent slopes		
SgD	Saratoga-Positas loams, 9 to 15 percent slopes		
SgE	Saratoga-Positas loams, 15 to 30 percent slopes		
ShE2	Soper gravelly loam, 15 to 30 percent slopes, eroded		
ShF	Soper gravelly loam, 30 to 50 percent slopes		
Sv	Sunnyvale silty clay, drained	Clear Lake (CA0013)	low alluvial plains
Su	Sunnyvale silty clay	Sunnyvale (CA1381)	

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
TeF	Terrace Escarpments		
Tf	Tidal marsh	Tidal Marsh	
VaE2	Vallecitos loam, 15 to 30 percent slopes, eroded		
Vaf	Vallecitos loam, 30 to 50 percent slopes		
VaG2	Vallecitos loam, 50 to 75 percent slopes, eroded		
Wa	Willows clay	Willows (CA0419)	
Wb	Willows clay, slightly alkali	Willows (CA0419)	
YaA	Yolo loam, 0 to 2 percent slopes		
YaB	Yolo loam, 2 to 5 percent slopes		
YeA	Yolo silty clay loam, 0 to 2 percent slopes		
YeC	Yolo silty clay loam, 2 to 9 percent slopes		
ZbA	Zamora clay loam, 0 to 2 percent slopes		
ZbC	Zamora clay loam, 2 to 9 percent slopes		
ZaA	Zamora loam, 0 to 2 percent slopes		

Hydric Soils in Santa Clara Area

Map Symbol	Soil Name	Hydric Component	Location Notes
ZaC	Zamora loam, 2 to 9 percent slopes		
ZeC3	Zamora and Cropley soils, 2 to 9 percent slopes, severely eroded		

SCS-SOILS-37A
3-75

U.S. DEPARTMENT OF AGRICULTUR
SOIL CONSERVATION SERVIC

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

Soil Survey Area: 610-Alameda County W. Part
State: CA

Date: 3/26/92

DESCRIPTION	SYMBOL
CULTURAL FEATURES	
BOUNDARIES	
National, state, or province	
County or parish	
Minor civil division	
Reservation (national forest or park, state forest or park, and large airport)	
Land grant	
Limit of soil survey (label)	
Field sheet matchline & neatline	
AD HOC BOUNDARY (label)	
Small airport, airfield, park, oilfield, cemetery, or flood pool	
STATE COORDINATE TICK	1 890 000 FEET
LAND DIVISION CORNERS (sections and land grants)	
ROADS	
Divided (median shown if scale permits)	
County, farm or ranch	
Trail	
ROAD EMBLEMS & DESIGNATIONS	
Interstate	85
Federal	287
State	52
Other	365
RAILROAD	
POWER TRANSMISSION LINE (normally not shown)	
PIPE LINE (normally not shown)	
FENCE (normally not shown)	
LEVEES	
Without road	
With road	
With railroad	
DAMS	
Large (to scale)	
Medium or small	W
PITS	
Gravel pit	⚒
Mine or quarry	⚒

DESCRIPTION	SYMBOL
CULTURAL FEATURES (cont.)	
MISCELLANEOUS CULTURAL FEATURES	
Farmstead, house (omit in urban areas)	•
Church	♁
School	♁
Indian mound (label)	∩
Located object (label)	⊙
Tank (label)	•
Wells, oil or gas	
Windmill	
Kitchen midden	∩
WATER FEATURES	
DRAINAGE	
Perennial, double line	
Perennial, single line	
Intermittent	
Drainage end	
Canals or ditches	
Double-line (label)	CANAL
Drainage and/or irrigation	
LAKES, PONDS AND RESERVOIRS	
Perennial	water w
Intermittent	intermittent int
MISCELLANEOUS WATER FEATURES	
Marsh or swamp	
Spring	o-
Well, artesian	
Well, irrigation	-o-
Wet spot	ψ

DESCRIPTION	SYMBOL
SPECIAL SYMBOLS FOR SOIL SURVEY	
SOIL DELINEATIONS AND SOIL SYMBOLS	CeA FoB2
ESCARPMENTS	
Bedrock (points down slope)	vvvvvvvvvvvvvvvvvvvv
Other than bedrock (points down slope)	
SHORT STEEP SLOPE	....
GULLY	∿∿∿∿∿∿∿∿
DEPRESSION OR SINK	◇
SOIL SAMPLE SITE (normally not shown)	Ⓢ
MISCELLANEOUS	
Blowout	◡
Clay spot	✱
Gravelly spot	∴
Gumbo, slick or scabby spot (sodic)	ø
Dumps and other similar non soil areas	≡
Prominent hill or peak	☼
Rock outcrop (includes sandstone and shale)	V
Saline spot	+
Sandy spot	⁙
Severely eroded spot	÷
Slide or slip (tips point upslope)	))
Stony spot, very stony spot	0 ⓪
RECOMMENDED AD HOC SOIL SYMBOLS	
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APPENDIX C.

WETLAND DETERMINATION DATA FORMS FOR THE MATADERO CREEK FLOOD CONTROL PROJECT AREA

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number: SP 1A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Seasonal Freshwater Wetlands
Transect ID : 1
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Conium maculatum*	H	FACW	9.		
2. *Salix laevigata*	T	NOL	10.		
3. *Typha angustifolia*	H	OBL	11.		
4. *Raphanus sativus*	H	NOL	12.		
5. *Rumex salicifolius*	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 5/3 = 60%

Remarks: Sample point located beneath willow riparian canopy at ecotonal boundary with upland.

HYDROLOGY

	Recorded Data (describe in Remarks):
	Stream, Lake, or Tide Gauge
	Aerial Photographs
	Other
x	No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)
Depth to Free Water in Pit: >16 (in.)
Depth to Saturated Soil 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

x	Inundated
x	Saturated
x	Water Marks
	Drift Lines
x	Sediment Deposits
x	Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

x	Oxidized Root Channels in Upper 12 in.
	Water-Stained Leaves
	Local Soil Survey Data
	FAC-Neutral Test
x	Other (Explain in Remarks)

Remarks: Hydrology supporting these wetlands orginates from a partial breach located in the upper portion of the south bank of Matadero Creek. Fresh water from the creek is conveyed through this breach into seasonal wetlands only during high-flow winter storm events. Algal mats present.

Sample Number
SP 1A

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class: Somewhat poorly drained
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10		10 YR 3/1	2.5 YR 4/1	common, 20%/distinct	sandy clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
x	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed [✓ or Low-Chroma] colors		Other (Explain in Remarks

Remarks:
Soil saturated. Mottles are oxidized root channels. Gleying is slight.

WETLAND DETERMINATION

	(Circle)
Hydrophytic Vegetation Present?	[✓ Yes] No
Wetland Hydrology Present?	[✓ Yes] No
Hydric Soils Present?	[✓ Yes] No

(Circle)

Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters. See photos in Appendix D.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
SP 1B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Willow Riparian
Transect ID : 1
Plot ID: B

VEGETATION

	Dominant Plant Species*	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Salix laevigata*	T	NOL	9.			
2.	*Vinca major**	H	NOL	10.			
3.	*Raphanus sativus*	H	NOL	11.			
4.	*Malva parviflora*	H	NOL	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0/4 = 0%

Remarks: Sample point located beneath willow riparian canopy with herbaceous layer of *Vinca major*.

HYDROLOGY

Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)
Depth to Free Water in Pit: >16 (in.)
Depth to Saturated Soil >16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
___ Inundated
___ Saturated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Although this sample point occurs within the creek floodplain, the elevated topography prevents hydrology associated with the partial breach in the south bank of the creek from reaching this portion of the project site.

SOILS

Sample Number
SP 1B

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-12		10 YR 3/2	---	faint	clay

Hydric Soil Indicators:

Histosol
Histic Epipedon
Suffidic Odor
Aquic Moisture Regime
Reducing Conditions
Gleyed or Low-Chroma colors

Concretions
High Organic Content in Surface Layer in Sandy Soils
Organic Streaking in Sandy Soils
x Listed on Local Hydric Soils List
Listed on National Hydric Soils List
Other (Explain in Remarks

Remarks:
Soil moist.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? Yes [✓ No]
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
No hydrophytic vegetation or hydrologic wetland indicators observed.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
SP 2A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Seasonal Freshwater Wetlands
Transect ID : 2
Plot ID: A

VEGETATION

	Dominant Plant Species*	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Rumex salicifolius*	H	OBL	9.			
2.	*Salix laevigata*	T	NOL	10.			
3.	*Atriplex triangularis*	H	FACW	11.			
4.	*Cyperus eragrostis*	H	FACW	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 3/4 = 75%

Remarks: Sample point located beneath willow riparian overstory.

HYDROLOGY

____ Recorded Data (describe in Remarks):
____ Stream, Lake, or Tide Gauge
____ Aerial Photographs
____ Other
X No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)
Depth to Free Water in Pit: 24 (in.)
Depth to Saturated Soil 24 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
____ Inundated
____ Saturated
x Water Marks
____ Drift Lines
x Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
____ Oxidized Root Channels in Upper 12 in.
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks: Hydrology supporting these wetlands orginates from a partial breach located in the upper portion of the south bank of Matadero Creek. Fresh water from the creek is conveyed through this breach into seasonal wetlands only during high-flow winter storm events. Sample point is within flood channel. Oozing water at 24 inches.

Sample Number

SP 2A

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-24		10 YR 3/2	---	few/faint	silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
x	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or [✓ Low-Chroma] colors		Other (Explain in Remarks

Remarks:
Soil moist. Gleyed soil below 24 inches.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? [✓ Yes] No
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)

Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number: SP 2B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Ruderal Upland
Transect ID : 2
Plot ID: B

VEGETATION

	Dominant Plant Species*	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Conyza canadensis*	H	FAC	9.			
2.	*Silybum marianum*	H	NOL	10.			
3.	*Salix laevigata*	T	NOL	11.			
4.	*Vinca major*	H	NOL	12.			
5.	*Raphanus sativus*	H	NOL	13.			
6.	*Cyperus eragrostis*	H	FACW	14.			
7.	*Conium maculatum*	H	FACW	15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 3/7 = 43%

Remarks: Sample point located in ruderal upland on ecotonal boundary with willow riparian vegetation.

HYDROLOGY

Recorded Data (describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

x No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil: 19 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Although this sample point occurs within the creek floodplain, the elevated topography prevents hydrology associated with the partial breach in the south bank of the creek from reaching this portion of the project site.

Sample Number

SP 2B

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-14		10 YR 3/2	---	none	clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma colors		Other (Explain in Remarks

Remarks:

WETLAND DETERMINATION

	(Circle)
Hydrophytic Vegetation Present?	Yes [✓ No]
Wetland Hydrology Present?	Yes [✓ No]
Hydric Soils Present?	Yes [✓ No]

(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
Negative indicators for all three weland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
SP 3A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]

Is the area a potential Problem Area? Yes [✓ No]

(If needed, explain on reverse.)

Community ID: Seasonal Freshwater Wetlands

Transect ID : 3

Plot ID: A

VEGETATION

Dominant Plant Species*	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. _Rumex salicifolius*_	H	OBL	9.		
2. _Salix laevigata*_	T	NOL	10.		
3. _Conium maculatum_	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 2/3 = 67%

Remarks: Sample point located beneath willow riparian canopy.

HYDROLOGY

Recorded Data (describe in Remarks):

Stream, Lake, or Tide Gauge
Aerial Photographs
Other

x No Recorded Data Available

Field Observation:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil 27 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

Inundated
X Saturated
X Water Marks
Drift Lines
X Sediment Deposits
X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

Oxidized Root Channels in Upper 12 in.
Water-Stained Leaves
Local Soil Survey Data
FAC-Neutral Test
Other (Explain in Remarks)

Remarks: Hydrology supporting these wetlands orginates from a partial breach located in the upper portion of the south bank of Matadero Creek. Fresh water from the creek is conveyed through this breach into seasonal wetlands only during high-flow winter storm events.

Sample Number
SP 3A

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
1-27		10 YR 3/2	---	few/faint	clay
27		2.5 Y 4/2	---	none	clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
X	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
X	Reducing Conditions		Listed on National Hydric Soils List
X	Gleyed [✓ or Low-Chroma] colors		Other (Explain in Remarks

Remarks:
Soil moist. Soil buttery textured and saturated below 27 inches.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? [✓ Yes] No
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)

Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
SP 3B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: April 26, 2000
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Upland Ruderal
Transect ID : 3
Plot ID: B

VEGETATION

	Dominant Plant Species*	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Rubus vitifolius*	H	FACW	9.			
2.	*Vinca major*	H	NOL	10.			
3.	*Conium maculatum*	H	FACW	11.			
4.	*Raphanus sativus*	H	NOL	12.			
5.	*Bromus mollis*	H	NI	13.			
6.	*Malva parviflora*	H	NOL	14.			
7.	*Sonchus oleraceus*	H	NI	15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 2/7 = 29%

Remarks: Sample point located within Matadero Creek floodplain in ruderal habitat adjacent to willow riparian vegetation.

HYDROLOGY

___ Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Inundated
___ Saturated
___ Water Marks
___ Drift Lines
x Sediment Deposits
___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Although this sample point occurs within the creek floodplain, the elevated topography prevents hydrology associated with the partial breach in the south bank of the creek from reaching this portion of the project site.

Sample Number
SP 3B

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		10 YR 3/3	---	none	
8		10 YR 3/2	---	none	sandy clay

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Suffidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma colors

- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- x Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks

Remarks:
Soil moist. Soil below 8 inches contains sharp, angular gravel component. This is probably fill material associated wiht maintaining the low flow south bank of Matadero Creek.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? Yes [✓ No]
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
Area supported by bypass flood berm at foot of bridge on south side. Topographically higher than lower reach, which prevents adequate hydrology to support wetlands in this upper area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number: 4A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Coastal Salt Marsh
Transect ID : 4
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salicornia virginica*	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/1 = 100%

Remarks: Dense, monospecific patch with 100% cover.

HYDROLOGY

Recorded Data (describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

x No Recorded Data Available

Field Observation:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: >16 (in.)
Depth to Saturated Soil 18 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated
- x Water Marks
- ___ Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- x Oxidized Root Channels in Upper 12 in.
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Sample site located within upper portion of diked northern coastal salt marsh flood plain. Wetlands within sample site under influence of subsurface hydrology associated with San Francisco Bay. Wetlands located behind gated diked levee. Mean high water on outboard soil of levee 3.1 ft.

Sample Number
4A

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-18		10 YR 3/2	2.5 YR 3/3	common/distinct	clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
x	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or [✓ Low-Chroma] colors		Other (Explain in Remarks)

Remarks:
Soils very moist to saturated from 0-18 inches. Hydrology the result of diked wetlands located behind a levee and high water tables associated with San Francisco Bay. Mean high water at 3.1 ft. Topographic elevation of wetlands on average 0.1 ft.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? [✓ Yes] No
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)

Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number: 4B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Upland Ruderal
Transect ID : 4
Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Picris echioides*	H	FAC	9.		
2. *Brassica nigra*	H	NOL	10.		
3. *Centaurea calcitrapa*	H	NOL	11.		
4. *Avena fatua*	H	NOL	12.		
5. *Lolium multiflorum*	H	FACW	13.		
6. *Salsola soda*	H	NOL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 2/6 = 33%

Remarks: Ruderal upland habitat above and directly adjacent to the west side of coastal salt marsh.

HYDROLOGY

____ Recorded Data (describe in Remarks):
____ Stream, Lake, or Tide Gauge
____ Aerial Photographs
____ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
____ Inundated
____ Saturated
____ Water Marks
____ Drift Lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
____ Oxidized Root Channels in Upper 12 in.
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks: Elevated topography prevents hydraulic influence of immediately adjacent diked floodplain.

Sample Number

4B

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10 YR 3/3	---	none	silty clay

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Suffidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- x Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks:
Soil appears partially composed of fill material assocated with construction of levee and vehicle maintenance road.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? Yes [✓ No]
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
Negative indicators for all three parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
5A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Coastal Salt Marsh
Transect ID : 5
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salicornia virginica*	H	OBL	9.		
2. *Scirpus robustus*	H	OBL	10.		
3. *Atriplex triangularis*	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 3/3 = 100%

Remarks:

HYDROLOGY

Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: 1-2 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
x Inundated
x Saturated
x Water Marks
___ Drift Lines
x Sediment Deposits
x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
x Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: One to two inches of standing water at sample site.

SOILS

Sample Number
5A

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		2.5 Y 3/1	—	none	clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
x	Suffidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
x	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or [✓ Low-Chroma] colors		Other (Explain in Remarks)

Remarks:
Soils inundated and saturated with salt water from San Francisco Bay.

WETLAND DETERMINATION

	(Circle)		(Circle)
Hydrophytic Vegetation Present?	[✓ Yes] No		
Wetland Hydrology Present?	[✓ Yes] No		
Hydric Soils Present?	[✓ Yes] No	Is this Sampling Point Within a Wetland?	[✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
5B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Upland Ruderal
Transect ID : 5
Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Picris echioides*	H	FAC	9.		
2. *Foeniculum vulgare*	H	FACU	10.		
3. *Rumex crispus*	H	FACW-	11.		
4. *Brassica nigra*	H	NOL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 2/4 = 50%

Remarks: Upland ruderal vegetation

HYDROLOGY

___ Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
___ Inundated
___ Saturated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: No hydrologic indicators observed. Sample site located on east side of vehicle maintenance road levee directly adjacent to coastal salt marsh wetlands.

Sample Number
5B

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10 YR 4/2	---	none	clay loam w/gravel

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma colors		Other (Explain in Remarks)

Remarks:
Fill material associated with construction of levee.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? Yes [✓ No]
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
Negative indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
6A

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Seasonal Freshwater Wetlands
Transect ID : 6
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Typha angustifolia*	H	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/1 = 100%

Remarks:

HYDROLOGY

___ Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: --- (in.)

Depth to Free Water in Pit: 24 (in.)

Depth to Saturated Soil 18 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
___ Inundated
x Saturated
x Water Marks
___ Drift Lines
x Sediment Deposits
x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
x Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: This patch of wetlands receives subsurface hydrology associated with directly adjacent diked coastal salt marsh and to some extent hydrology from Matadero Creek located several hundred feet north. Freshwater hydrology associated with winter storm events floods these wetlands supporting the cattails and willow riparian habitat. Subsurface hydrology influences wetlands during summer dry period.

Sample Number
6A

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-17		10 YR 3/1 (very moist)	2.5 YR 3/3	common/distinct	clay
18-23		10 YR 3/1 (saturated)	2.5 YR 3/3	common/distinct	clay
24		10 YR 3/1 (inundated)	2.5 YR 3/3	common/distinct	clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
x	Suffidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
x	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed [✓ or Low-Chroma] colors		Other (Explain in Remarks)

Remarks:
Saturated at 18 inches, standing water at 24 inches. Water associated with San Francisco Bay and flood waters of Matadero Creek.

WETLAND DETERMINATION

	(Circle)	
Hydrophytic Vegetation Present?	[✓ Yes] No	
Wetland Hydrology Present?	[✓ Yes] No	
Hydric Soils Present?	[✓ Yes] No	

(Circle)

Is this Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Positive indicators observed for all three wetland parameters.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Sample Number
6B

Project/Site: Matadero Creek Flood Control
Applicant/Owner: Santa Clara Valley Water District
Investigator: B. Cleary

Date: August 28, 2001
County: Santa Clara
State: California

Do Normal Circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situations?) Yes [✓ No]
Is the area a potential Problem Area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: Upland Ruderal
Transect ID : 6
Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Picris echioides*	H	FAC	9.		
2. *Foeniculum vulgare*	H	FACU	10.		
3. *Brassica nigra*	H	NOL	11.		
4. *Bromus mollis*	H	NI	12.		
5. *Raphanus sativus*	H	NOL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/5 = 20%

Remarks: Ruderal upland habitat associated with small dike separating seasonal freshwater wetlands from diked coastal salt marsh.

HYDROLOGY

___ Recorded Data (describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
x No Recorded Data Available

Field Observation:

Depth of Surface Water: — (in.)

Depth to Free Water in Pit: >16 (in.)

Depth to Saturated Soil >16 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Inundated
___ Saturated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

x Oxidized Root Channels in Upper 12 in.
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Sample site located on upland dike separating two types of wetland habitats. Oxidized root channels at 0-8 inches associated with repeated wetting during winter months.

Sample Number
6B

SOILS

Map Unit Name
(Series and Phase)

Taxonomy (Subgroup):

Drainage Class:
Field Observations:
Confirm Mapped Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-18		10 YR 3/2	—	none	silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Suffidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma colors		Other (Explain in Remarks)

Remarks:
Partial fill material associated with construction of dike separating two wetland habitats.

WETLAND DETERMINATION

(Circle)

Hydrophytic Vegetation Present? Yes [✓ No]
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

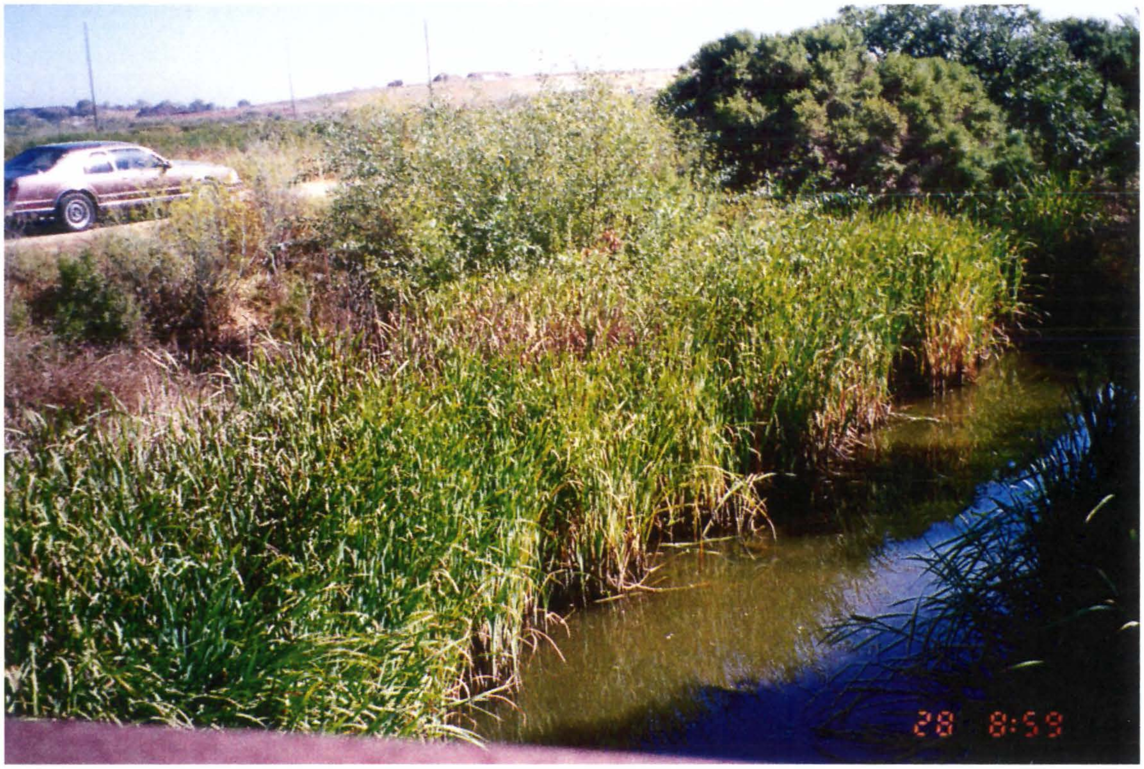
(Circle)

Is this Sampling Point Within a Wetland? Yes [✓ No]

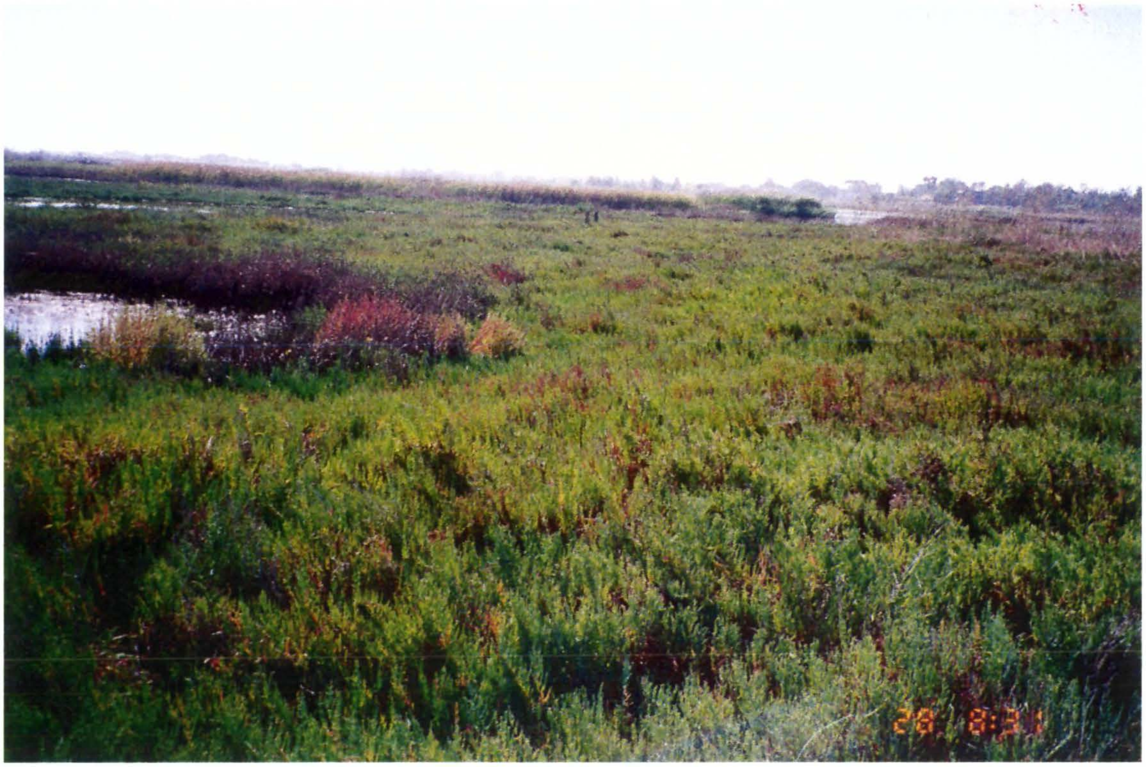
Remarks:
Negative indicators observed for all three wetland parameters.

APPENDIX D.

PHOTOGRAPHS OF THE
MATADERO CREEK FLOOD CONTROL PROJECT AREA



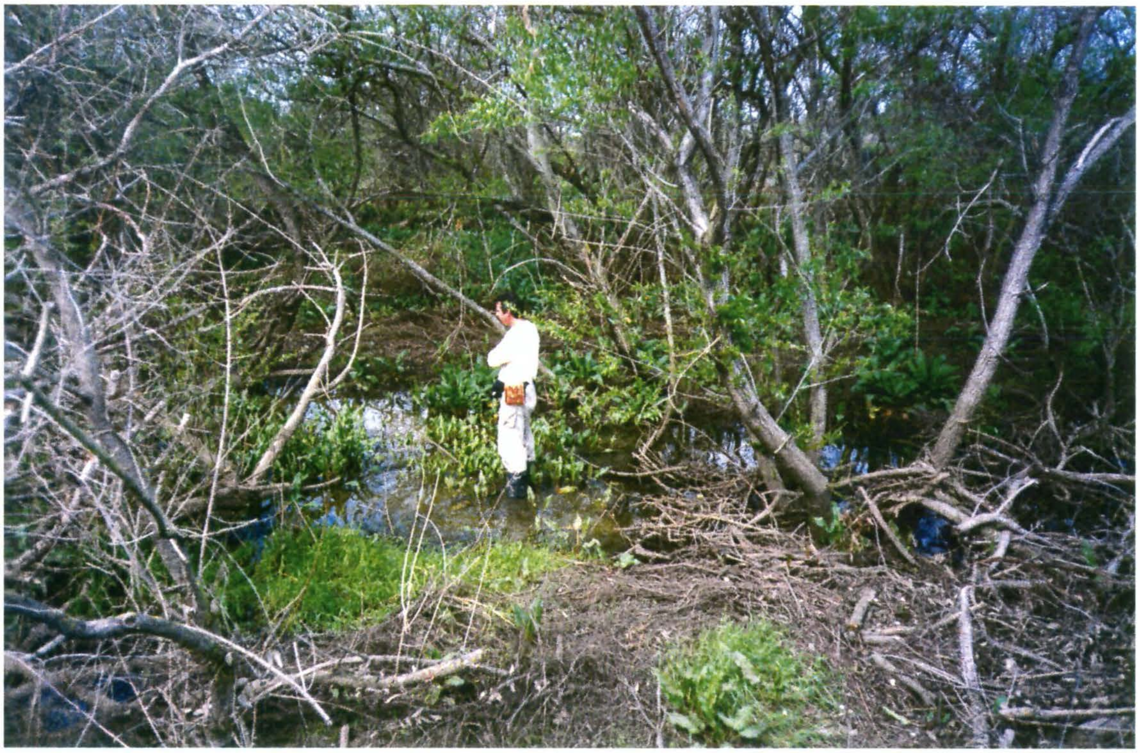
Photograph 1: Looking northeast at standing water within the downstream portion of Matadero Creek directly adjacent to the east side of U.S. Highway 101 during the month of August 2001. The presence of several feet of standing water in the channel suggests daily tidal influence from the San Francisco Bay by way of Mayfield Slough.



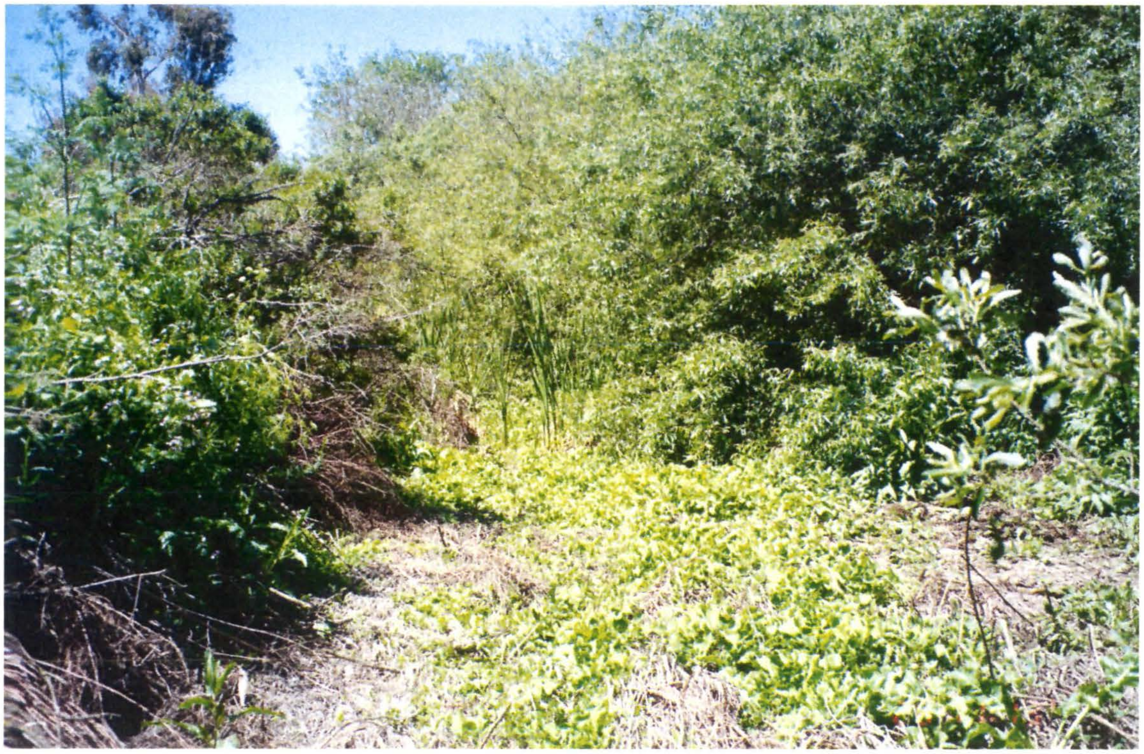
Photograph 2: Looking east at coastal salt marsh habitat within the diked Palo Alto Flood Control Basin east of U.S. Highway 101 in the southern portion of the project site. This habitat is dominated by common pickleweed and alkali bulrush.

Photograph 3: Looking east at coastal salt marsh habitat within the diked Palo Alto Flood Control Basin east of U.S. Highway 101 in the southern portion of the project site. Note bodies of "other waters" hydrologically influenced in the dry summer months largely by the high water tables associated with the San Francisco Bay.

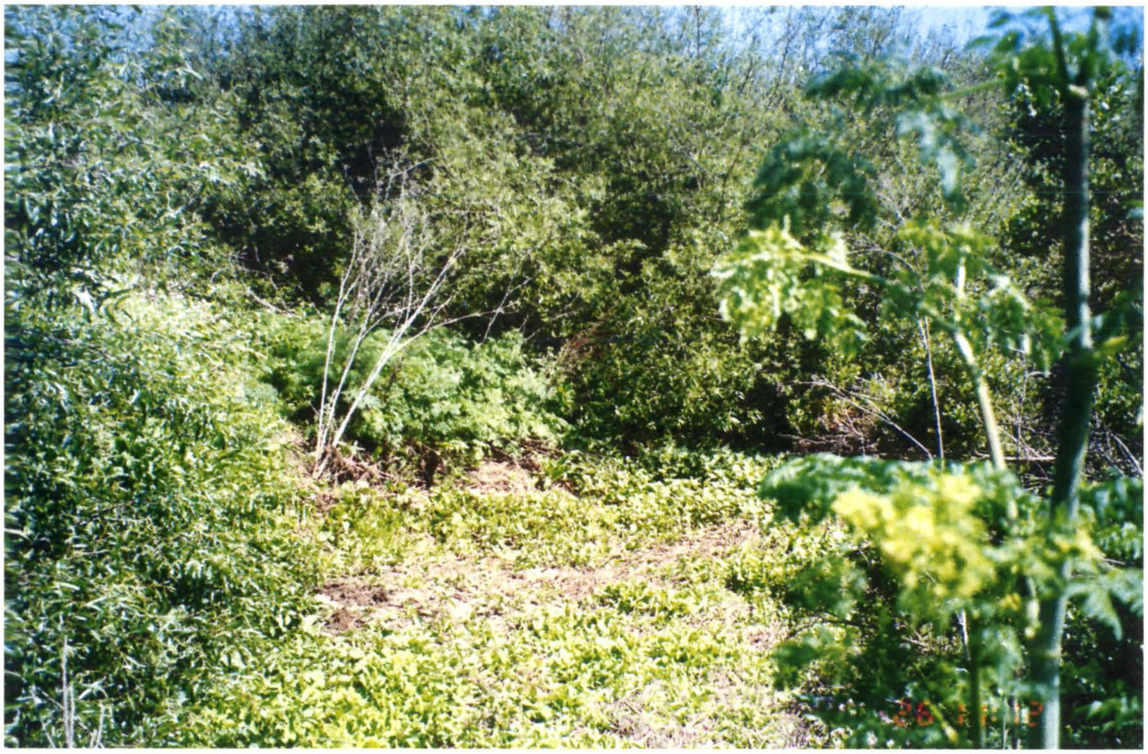
Photograph 4: Looking north at surface ponding in a topographic depression within the Matadero Creek floodplain on the south side of the creek east of U.S. Highway 101. Hydrology supporting these potential jurisdictional wetlands originates from a partial breech of the south bank low-flow channel of Matadero Creek, and conveys water only during the winter rainfall period.



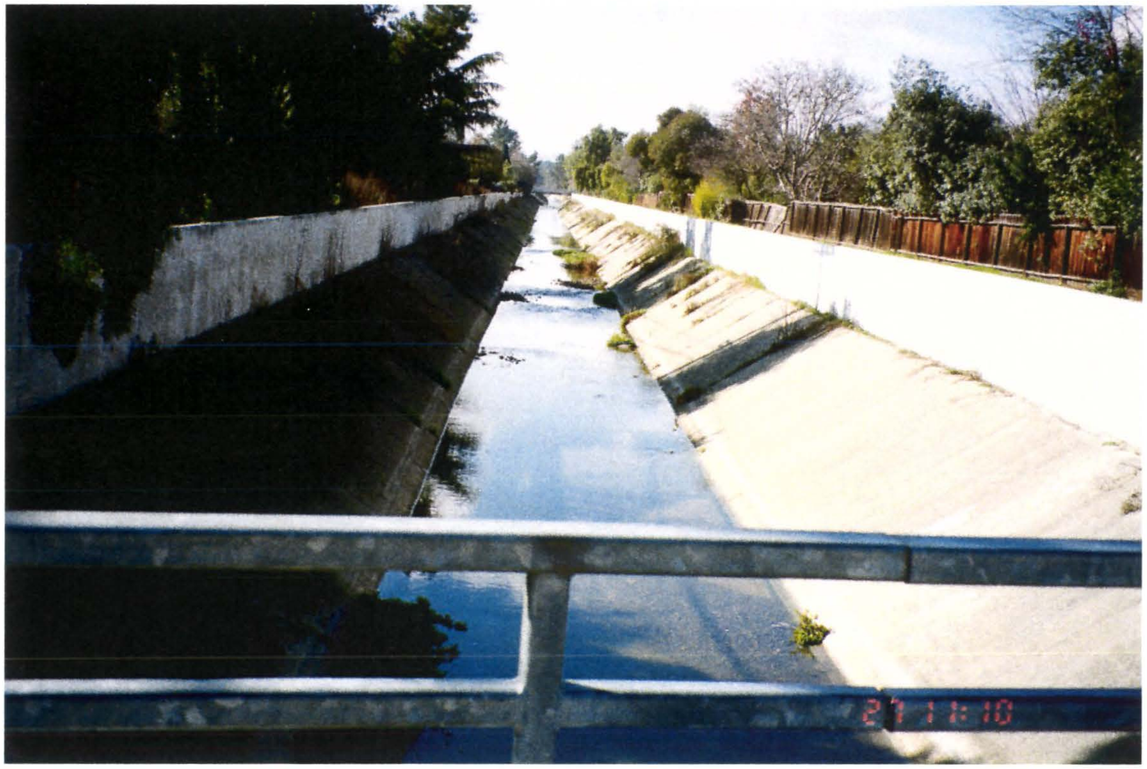
Photograph 5: Looking north at surface ponding in the same topographic depression shown in photograph 4. These potential jurisdictional wetlands are underlain by Alviso Clay soils that support standing water for several months during the winter rainfall period.



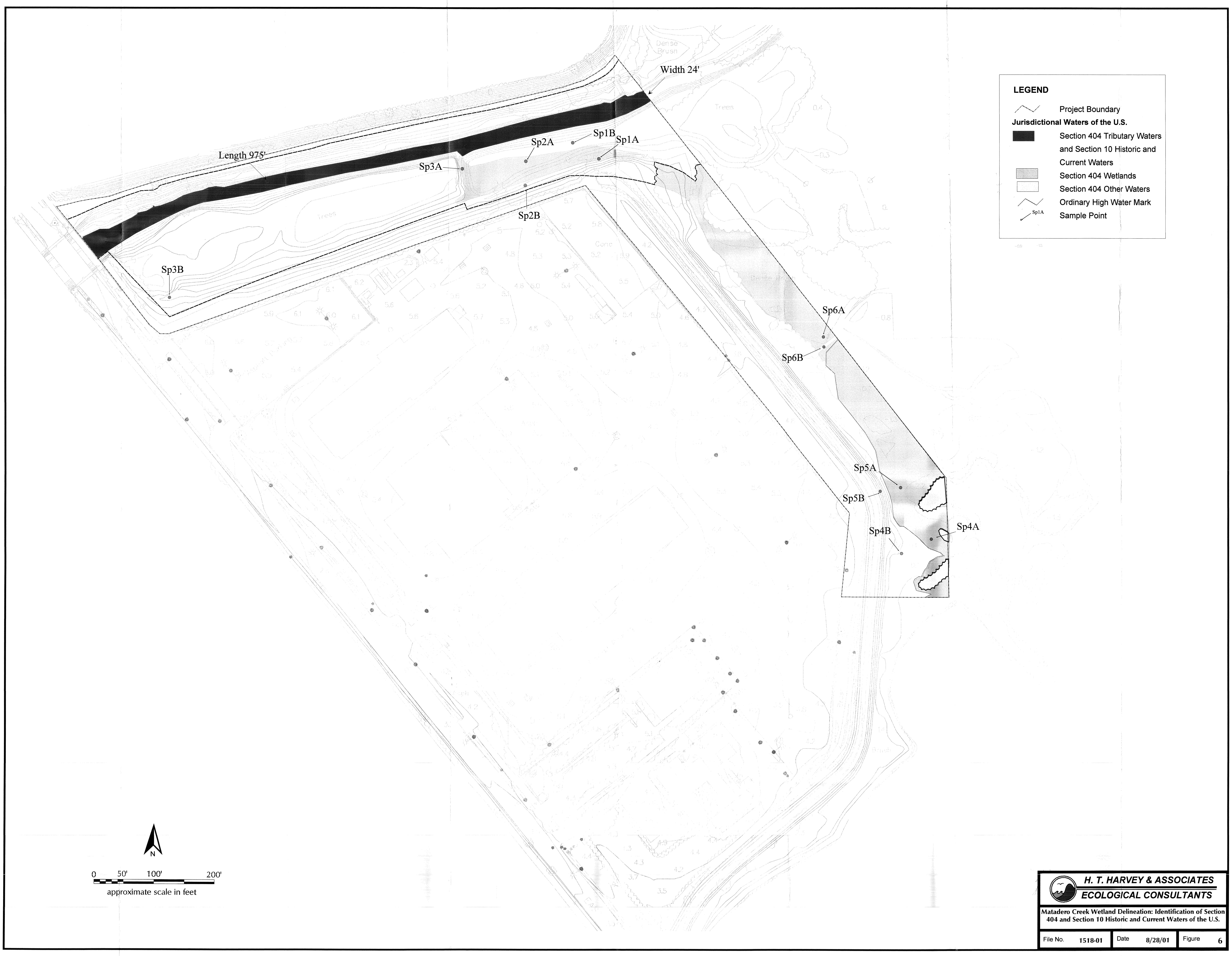
Photograph 6: Looking north at hydrophytes in the same topographic depression shown in photographs 4 and 5 during the summer dry period. Note the absence of standing water on the surface of these potential jurisdictional wetlands. Subsurface soils from 12 to 24 inches are dry to slightly moist during the summer period.



Photograph 7: Looking north at hydrophytes including cattails in the same topographic depression shown in photographs 4, 5, and 6 during the summer dry period. Note the absence of standing water on the surface of these potential jurisdictional wetlands. Subsurface soils from 12 to 24 inches are dry to slightly moist during the summer period.



Photograph 8: Looking west at the concrete-lined upstream portion of Matadero Creek at the Louis Road Bridge crossing west of U.S. Highway 101. Note the small patches of hydrophytes growing along the toe-of-slope of the channel.



H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Matadero Creek Wetland Delineation: Identification of Section 404 and Section 10 Historic and Current Waters of the U.S.

File No. 1518-01	Date 8/28/01	Figure 6